ENGINEERING
LIBRARY

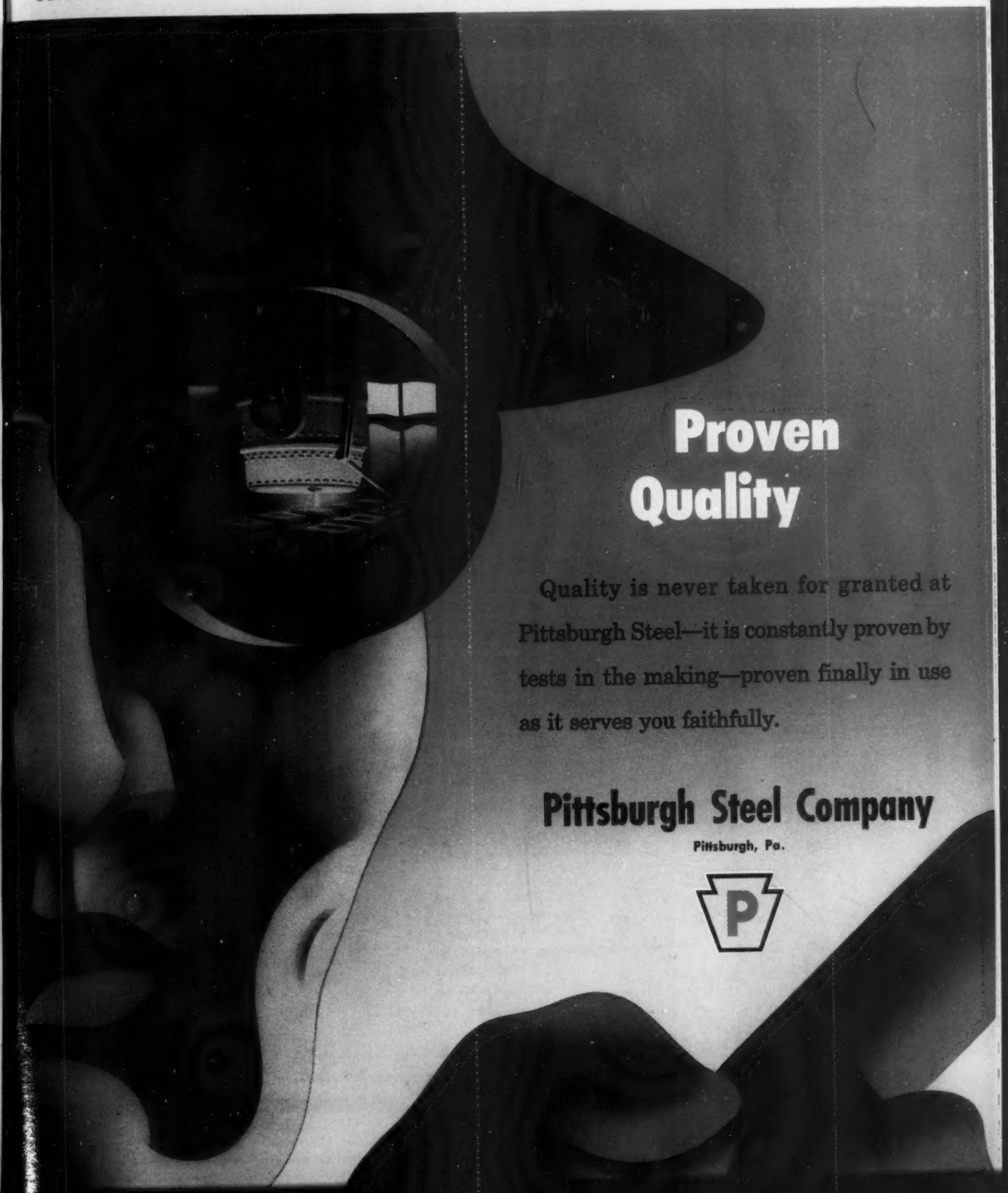
June 20, 1949

JUN 21 1949

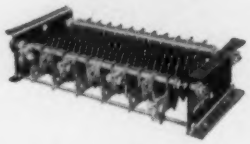
STEEL

The Magazine of Metalworking and Metalproducing

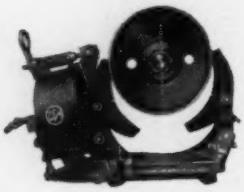
CONTENTS — PAGE 61


Proven
Quality
Quality is never taken for granted at Pittsburgh Steel—it is constantly proven by tests in the making—proven finally in use as it serves you faithfully.
Pittsburgh Steel Company
Pittsburgh, Pa.
P

Complete Control for Cranes

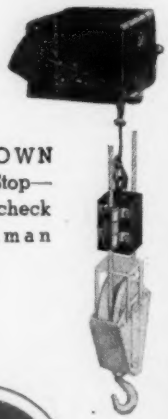


TAB - WELD Resistors — no burning where burning would cause high up-keep.



LONG-LIFE Brakes give high speed performance — with low up-keep.

SHORT-THROW Narrow-width Cam Master switches are easy on the operator.



YOUNGSTOWN Safety Limit Stop— a positive check against human error.

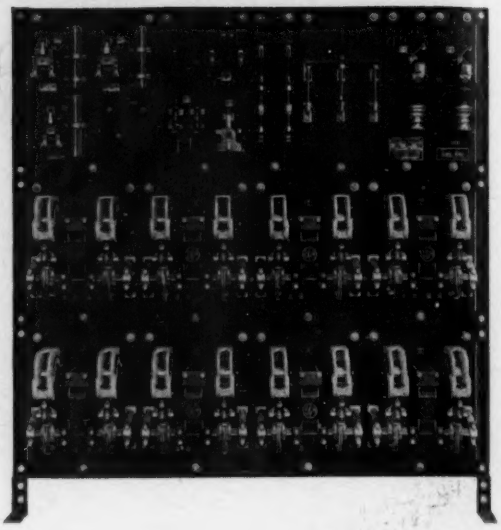
E&M

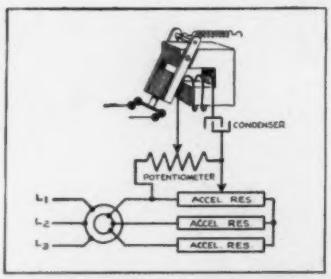
EC&M FREQUENCY RELAYS Improve A-C Crane Performance These Three Ways . . . .

1. ***Good inching*** **because weak values of motor torque are provided.**

2. ***Plugging-point*** **controlled with precision by one adjustable relay.**

3. ***Smooth acceleration*** **over entire speed. range of motor—heavy loads do not overshoot regenerative lowering speed.**



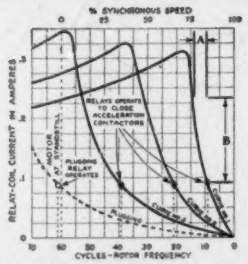


The Changing Rotor Frequency— EC&M uses this motor characteristic for accurate performance

At standstill, the induced frequency in the secondary of a wound-rotor motor equals the frequency of the voltage applied to the motor-primary. As the motor accelerates, the secondary frequency declines. During a plugging operation, the frequency may be as much as double the frequency of line voltage. This varying frequency provides an accurate means for controlling acceleration contactors which insert or remove secondary external resistance to give the desired performance.

Equally important is the quick pick-up and clean drop-out of EC&M Frequency Relays at different frequencies. Each relay operates from a resonant circuit. Previous relays of standard design and connected to the rotor circuit were handicapped by a narrow range of adjustment with resultant high maintenance to keep them adjusted. EC&M Frequency Relays not only eliminate adjustment-maintenance but permit liberal latitude in motor operation without sacrificing safety. For A-c cranes, specify EC&M Frequency Relay Control.

ACCURATE Overload Protection — Magnetic balance absorbs high starting currents, allowing low relay-setting for running-conditions.



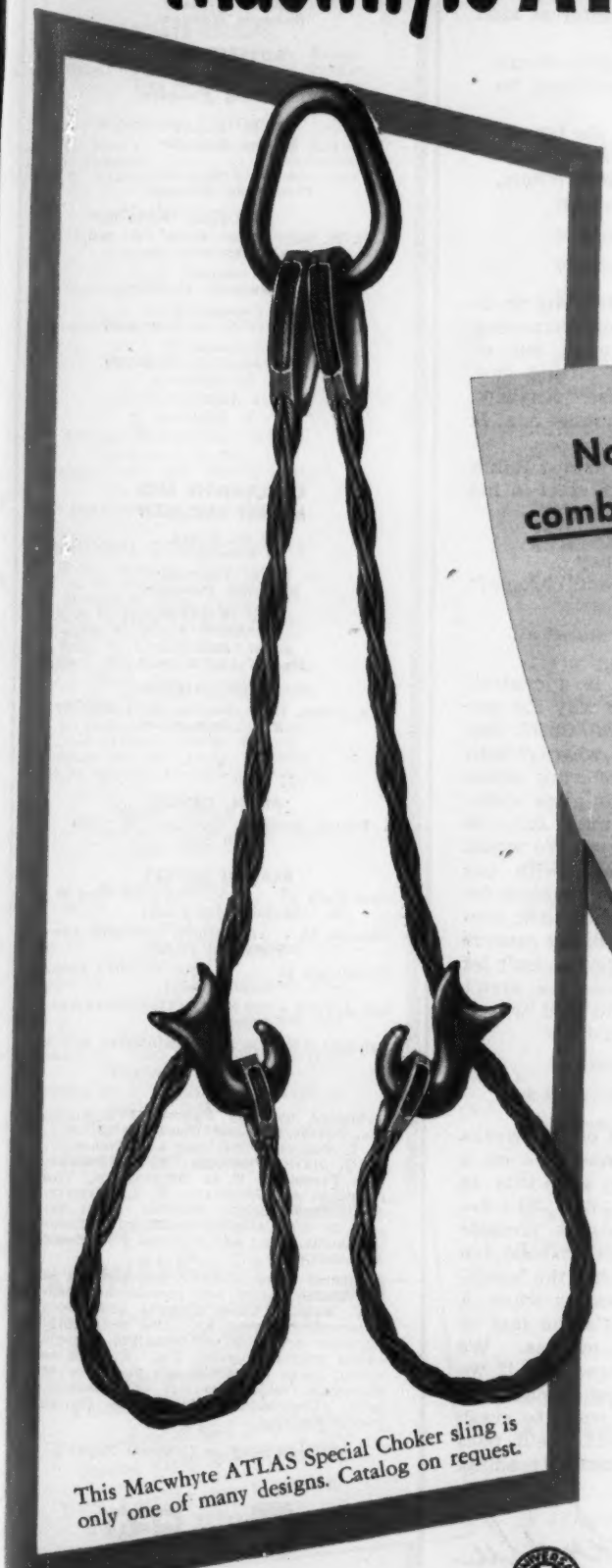
ACCURATE Operation from motor-secondary made possible by frequency relays.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 East 79th Street • Cleveland 4, Ohio

It pays to specify

Macwhyte ATLAS Braided Wire Rope Slings

There's a Macwhyte Sling that's the right sling for any sized load.



This Macwhyte ATLAS Special Choker sling is only one of many designs. Catalog on request.

No other braided sling has this combination of construction features:

1. ATLAS Slings are braided from right lay and left lay *endless* ropes.
2. In ATLAS Slings the left lay ropes are braided to the right, and the right lay ropes are braided to the left.
3. All ropes in ATLAS Slings follow a continuous spiral path throughout the entire body length.

This special construction guarantees *perfect balance*

. . . greater flexibility
. . . . resistance to kinking
. . . better purchase on the load
. . . greater reserve strength
. . . maximum safety

MACWHYTE COMPANY

2912 Fourteenth Avenue
Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.

• • • • •

Macwhyte Distributors throughout the U.S.A. and other countries. Mill Depots in the following cities: New York, Pittsburgh, Chicago, Minneapolis, Fort Worth, Portland, Seattle, San Francisco, Los Angeles

AD 952-S

Member National Safety Council

Behind the Scenes...

They're Looker Than Smart

From the American Brake Shoe Co. has come a small booklet which gives much solace to us. It's a collection of sayings, notes, philosophy, etc., from Wm. B. Given Jr., president of the company. The thing which gives us a new lease on life is a little statement from that respected executive which says that most men are smarter than they look. We figure there is probably still some hope left.

High Flying

With the accent in many quarters on prices, we want to call attention to the price range on bombers, as brought out in the wake of the talk about investigating the B-36. Seems that most of our military purchases at the moment are being concentrated on two styles, the B-36 and the B-47. The B-36 is the more expensive, costing over $3,000,000 each. The B-47 is considerably more economical, costing under $3,000,000 each, according to the report. From where we sit, looks like there's a difference of 2c or more in the cost of these airplanes. We certainly appreciate the thoughtfulness of the Air Force in providing these specific figures for the general public.

Fifty Years Ago in Ads

On June 22, 1899 we issued an issue which carried twenty-five separate ads on its front cover. This wasn't unusual—all our issues in those days carried about that same number. They were all small "classified-type" ads, most of which ran unchanged either in copy or in position week after week. This despite the fact that we ran in those days a fill, which was spotted somewhere on the front cover each week stating, "Advertisements that are frequently changed bring best results." One steel company in the Pittsburgh district carried as the complete copy in its advertising space this glowing message, "It isn't our fault that nobody else is making good galvanized iron".

Indians Are Verse

Some of our readers have taken us to task for the sudden silence surrounding our column where indians are concerned. Seems that we used to talk about indians, particularly Indians with a capital I. Since there seems to be a shroud cast around the Cleveland Stadium, in full view out our office window, we perhaps had better talk about a different kind of indian, to wit:

There once was a cute little Sioux
Whose figure was something to vioux.
When she swished past the tepees,
The braves all got creepies
And every last one yelled "Wioux, wioux!"

Metallic Rhymes

Our non-aesthetic readers will probably give us up for good for running two poems in one column, but at any rate we will try—having just renewed our poetic license. Anyhow, limericks are like peanuts—one is just tantalizing!

A young metallurgist named Rohm
Made a super strength steel in his home.
He said, "Its efficiency
Comes from a sufficiency
Of limburger, onions and chrome!"

Unstained Contest

Did you know there is a contest, with cash prizes, under way for you readers? Well, there is. Check last week's issue, page 142, where Washington Steel Corp. is offering prizes for new uses of its thin-gage stainless steel. You have until June 30 to get yourself an entry. We would probably win in a walk, with our ideas on how to use thin stainless for diaper liners, lobster bibs, book covers, pork barrel liners, flying saucers and poker decks. However, don't let that worry you, because we aren't eligible. Just go ahead and win it yourself, we don't care!

Puzzle Corner

The addition problem of two weeks ago, involving Adam and Eve on a raft, looks something like this in numbers: $8384+803+626+50+8=9871$. This is the largest possible sum, although there are at least ten others which will satisfy the conditions. The smallest occurs when A is equal to zero. That's the last of our current crop of puzzles. We could, of course, continue this if we had some real sharp new numbers, so if any of you readers want to crash through with your pets, we'll pass them along for light summer reading.

Shrdlu

(Editorial Index—page 61)

STEEL

Vol. 124—No. 25 June 20, 1949

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
CALVIN FISHER, JR.
Pittsburgh:
S. H. JASPER, B. C. SNELL
Chicago:
L. C. PELOTT, V. G. BRETTMAN
Cleveland:
D. C. KIEFER, H. G. ROWLAND
W. L. POLAND
Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director
R. L. HARTFORD
Research Manager
H. E. METZNER
Circulation
G. R. EBERSOLE
Mail & List Service
Field Representatives:
C. A. PRICE, H. R. DUNNE, D. G. HEWITT
R. W. SCHEINERT

•

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17 .....16 East 43rd St.
Murray Hill 2-2581
Chicago 11.....520 North Michigan Ave.
Whitehall 4-1234
Pittsburgh 19 .....2806 Koppers Bldg.
Atlantic 3211
Los Angeles 4 130 N. New Hampshire Ave.
Fairfax 1758
London: 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio. E. L. SHANER, Chairman and Treasurer; G. O. HAYS, President; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Controlled Circulation Audit, Inc.; and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1949 by the Penton Publishing Co.

Editorial Staff on Contents Page

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Market Editor

JAY DEEULIS
Engineering Editor

J. D. KNOX
Steel Plant Editor

GUY HUBBARD
Machine Tool Editor

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • FRANK R. BRIGGS
VANCE BELL • WALTER F. TOERGE
DAN REEBEL

ASSISTANT EDITORS

HENRY J. HOLTZ • DOLORES K. BLAHA
JOHN S. MORGAN • L. J. SKUDERIN
EDWIN L. KARPICK • M. T. BORGERHOFF

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York, Boston

J. C. SULLIVAN
Pittsburgh Editor

A. H. ALLEN
Detroit Editor

E. F. ROSS
Chicago Engineering Editor

HOWARD C. TUTTLE
Chicago News and Market Editor

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC L. HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
BERT D. LYNN, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*
HERBERT GROSS, *Dusseldorf, Germany*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17.....16 East 43rd St.
Murray Hill 2-2581

Chicago 11.....520 North Michigan Ave.
Whitehall 4-1234

Pittsburgh 19.....2806 Koppers Bldg.
Atlantic 3211

Detroit 2.....6560 Cass Ave.
Madison 3024

Washington 4...1123 National Press Bldg.
Executive 6849

Los Angeles 28.....1452 N. Seward St.
Hudson 2-4439

London..2 Caxton St., Westminster, S.W.1

Business Staff on Page 4

NEXT WEEK . . .

Recent Developments in Titanium And Titanium Alloys—II

Automatic Buffing of Plated Hub Caps

Production of Hot and Cold Rolled Strip and Sheet—IV

New Facility for Drawing Stainless Wire

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 124, NO. 25 JUNE 20, 1949

NEWS

★ As the Editor Views the News 63
★ News Summary 67
Business Volume Down, But Above Prewar 69
Recession Not Depression, Advertising Group Told 70
Employers Seek To Hold Wage Line 71
Pricing Bill Chances Good for House Approval 72
Western Reserve Steel's Output May Begin Nov. 1 72
Farm Machine Needs Fall as Record Output Meets Demand 73
Capital Equipment Exports Seen as Sales Boosters 74
Seek Prop for Slow Machine Tool Sales 75
★ Windows of Washington 76
Europe's Transport Up 79
Steel Founders Told Some Industrial Relations Policies Outdated 80
★ Calendar of Meetings 81
★ Mirrors of Motordom 83
Sales Levels Hold as ATF Diversifies, Broadens Distribution 86
★ Briefs 87
★ The Business Trend 88
★ Men of Industry 90
★ Obituaries 95
★ Construction and Enterprise 176

TECHNICAL

★ Engineering News at a Glance 97
Centrifugal Casting Welding Rods 98
Recent Developments in Titanium and Titanium Alloys—I 100
★ Seen and Heard in the Machinery Field 105
Production of Hot and Cold Rolled Strip and Sheets—III 106
Automatic Operation, Greater Precision Feature New Hones 118
★ Progress in Steelmaking—Engineered Instrumentation Makes Quality Control of Tin Plate Production Effective 120
New Alloy Possesses High Electrical Resistivity 129
Cuts Handling Costs by Shipping in Steel Containers 130
★ New Products and Equipment 145
★ Helpful Literature 151

MARKETS

★ Market Summary 153
★ Market Prices and Composites 154
Copper Supplies Not Excessive 158

★ *Advertising Index* 184

Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

★ Denotes Regular Features.

MORGAN
WORCESTER
ROLLING MILLS

16 MORGAN MERCHANT MILLS
roll out high tonnages, accurately, at low cost
MORGAN CONSTRUCTION COMPANY
SPEAKING OF ACCEPTANCE
63 Morgan Billet Mills
are here
there
everywhere
MORGAN CONSTRUCTION COMPANY
18 MORGAN STRIP and SKELP MILLS are promoting recovery in five countries
MORGAN CONSTRUCTION CO.
39 MORGAN ROD MILLS
operate efficiently in ten countries
MORGAN CONSTRUCTION CO.

198
on the job*
. . more on the way

A high percentage of the world's output of billets, rods, merchant shapes, strip and skelp is rolled on Morgan mills.

Morgan achieved preeminence in the field by introducing the first successful continuous rolling mill and has retained leadership through a steady stream of technical advancements.

No two Morgan Mills are exactly the same. Each was engineered to meet specific needs. Each fulfilled its purpose a little better than its predecessor.

With 198 mills and 60 years behind us we are ready to apply what we have learned to *your* problem. Why not write us today to talk it over? RM-16

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

English Representative: International Construction Company
56 Kingsway, W. C. 2, England

*This includes 22 mills of types not illustrated.

June 20, 1949

Fear of Government

Opinions as to the business outlook differ sharply. While the majority seems to hold that the present adjustment is a recession which need not be severe or of long duration, there is a distinct undercurrent of uneasiness based upon the feeling that developments during the next few months might touch off a psychological reaction whereby we could frighten ourselves into real trouble.

A hint of this possibility, which has been voiced a number of times recently, was again expressed last week by Alfred P. Sloan Jr., chairman of the board of General Motors Corp. While he said he was unable to explain the recent sharp dip in the stock market, he suggested that it might be due to uncertainty over Washington policies and to the fact the country is moving into a socialistic state, whether it realizes the trend or not.

Undoubtedly concern about the present recession is heightened by evidences that the present government administration may adopt extreme measures if unemployment rises to the danger point. Inasmuch as Mr. Truman is committed to what he calls a welfare state and repeatedly has indicated that he often takes his cue from the leaders of union labor, it is conceivable that he might try to head off a depression by means of rigid government controls and other federally sponsored devices. In any such attempt, the medicine most certainly would be more disastrous than the ailment it was intended to cure.

The truth is that the President's advisors had an elaborate program prepared to curb inflation. They have stuck to it persistently, even when it was apparent that deflation had replaced inflation. Rather than abandon this grandiose program, they would like to adopt it as a cure for deflation. It is definitely a worse remedy for deflation than it would have been for inflation.

If Congress—and particularly the more economically sound members of Mr. Truman's own party—could now induce him to depart from his social state objectives at least until after the present trouble has subsided, then strong corrective influences now operating would reverse the present downward trend of business before the year end.

Right now fear of possible government excesses is gravely complicating the process of economic adjustment.

* * *

UNIONS RESOURCEFUL: Indicative of the resistance unions may encounter in pressing their demands for fourth round increases was the action of General Electric Co. last week.

United Electrical Workers had wrapped up its demands as to wages, insurance and pensions in a single package involving a $500 a year increase. GE turned this down flatly after the first day of negotiations. The union had argued that the increase would serve as a pump primer. The company countered with the statement that "any general wage increase across the country or across an industry would simply be a general increase in costs and prices, certainly the wrong direction to take when trying to get costs and values down to attract able but reluctant buyers."

Negotiations between U. S. Steel subsidiaries and United Steelworkers got under way last week. No early agreement is expected, but a rumor is circulating to the effect that if agreement is not reached as the July 16 deadline approaches, Philip Murray will announce he intends to call a strike and will petition President Truman to declare a national emergency for 80

(OVER)

days, as provided in the Taft-Hartley Act. Mr. Truman would appoint a fact-finding board. While its findings would not be binding on industry, the union apparently feels its recommendations—presumably favorable to labor—would attract substantial public support.

This strategy may be sheer speculation, but it and the UEW pump priming argument suggest that the unions will meet employers' resistance with resourcefulness and cleverness. —p. 71

* * *

NO RECESSION IN AUTOS: Any reader who may be somewhat depressed by the current news of the business recession can gain a modicum of relief in "Mirrors of Motordom" in this issue. At the moment, automobile manufacturers exhibit no signs of uneasiness as to business volume. Everywhere in motordom the pressure is on for more production.

"Second shifts are being added to assembly lines, with some difficulty being experienced in obtaining a sufficient supply of experienced help. Many 8-hour shifts have been extended to 9 hours, although in one case union objections forced a cutback to 8½ hours. . . . Packard has increased daily assemblies. . . . Chrysler divisions have reached a postwar peak in production. . . . General Motors set a new all-time record in May. . . . Studebaker set an all-time record in May. . . . Kaiser-Frazer, while considerably off the pace of a year ago, has progressively improved its schedules. . . ."

All in all, motordom is building up a marvelous production record. Even allowing for setbacks later on, it has a fighting chance to make 1949 its banner year. —p. 83

* * *

TITANIUM TO THE FORE: From present indications, the metalworking industries henceforth will be more conscious of the merits of titanium and its alloys. Metallurgists know that the metal possesses many properties which make it a desirable construction material. Now that it can be manufactured successfully in ductile form, its production in quantity probably can be expected in the not-too-distant future.

Factors contributing to this promising development include an abundant raw material supply and three important properties of titanium, namely a relatively low specific gravity, good resistance to corrosion and high tensile strength. In competition with stainless steel, titanium has the advantage of light weight; in competition with light metals, its resistance to corrosion is favorable; and in competition with structural steels, corrosion resistance, lightness and possibly ease of surface hardening may prove to be the controlling factors. —p. 100

* * *

VERMONTERS ARE HOSTS: This week hundreds of users of machine tools from all over the country will visit the Springfield-Windsor machine tool area in eastern Vermont to view the products of four builders. The visitors will be met at the railroad stations at Albany, N. Y., and Charlestown, N. H., and conveyed by automobile to the builders' plants.

This idea is not entirely new. Individual companies have staged visitations of this kind on numerous occasions and now and then neighboring plants in different industrial groups have held "open house" simultaneously. This current Vermont hospitality probably is new in that four companies in the same industrial group have joined hands in playing host to customers and prospective customers.

Reporting this interesting visitation for this publication will be Machine Tool Editor Guy Hubbard. As a native of Windsor, he probably rates this as the most welcome editorial assignment he has had for a long time. —p. 105

* * *

WHY BASE PRICES HOLD: Some critics of the steel industry, who obviously are not too familiar with the price structure on finished steel, wonder why producers have not reduced base prices, as have sellers of certain nonferrous metals.

Apparently those who question the price policy do not realize that recently the prevailing base prices were considerably lower than premium prices obtained by many sellers. For several months, premium prices have been cut repeatedly, but they have not entirely disappeared. There is little inducement to reduce base prices as long as sellers are able to obtain higher, premium prices. Also the fact that sharp reductions in copper, lead and zinc have not attracted orders is a deterrent to cutting base steel prices at this time.

However, continued market weakness sooner or later will force lower base prices—probably after wage commitments are known. —p. 153

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS WEATHER—Although the volume of most metalworking industries, excepting automotive, has dropped rather sharply this year, production and shipments still are higher than in the better prewar years (p. 69). Steel production on a tonnage basis is about 50 per cent greater than the monthly average in 1937 and 1939 and about equal to 1941 output. Gear sales are well ahead of prewar years. Foundry equipment orders have picked up slightly from a low point reached in January and February. Employment is only slightly under the peak levels; unemployment has increased but is small compared with prewar normals.

FOURTH ROUND—Big Labor is meeting stern resistance to its demands for new wage increases, pensions and comprehensive social insurance programs (p. 71). General Electric has turned down the request of CIO electrical workers for a $500 annual package increase. Basic steel companies are cool toward demands of the United Steelworkers for wage increases and insurance programs. Some of the larger companies have indicated they will adhere by their contract provisions which exclude pensions as a bargaining subject this year. Metalworking companies having contracts with the steelworkers' union generally are waiting the outcome of negotiations between the union and U. S. Steel before signing new agreements. The possibility of strikes later in the summer should not be discounted too sharply, as the unions appear to be insistent on more concessions than industry is likely to grant in the face of declining business.

PRICING—Chances for passage of the O'Mahoney bill to legalize freight absorption in the absence of collusion appeared to be good late last week (p. 72). The measure would remove some of the confusion which has surrounded pricing policies since the Supreme Court outlawed the basing point system last year, but does not give blanket approval to a return to the former pricing policies of industry.

EXPORT MARKETS—Outlook for overseas sales of capital equipment continues good, according to trading authorities, who believe this is a strategic time for United States manufacturers to make a strong bid for foreign business (p. 74). American manufacturers now have a slight price advantage over European builders, although competition from countries rebuilt with ECA aid is expected to increase rapidly. Exports of all goods from this country are at a rate of $10 to $12 billion annually, more than twice the prewar average.

FOREIGN AID—As domestic business turns downward, congressmen are becoming worried over the lavish spending to aid foreign countries (p. 76). This attitude is reflected in mounting opposition to the Marshall Plan expenditures, the reciprocal trade program, and the International Trade Organization.

EUROPEAN TRANSPORT—One of the worst casualties of the war in Europe was the demoralization of transportation systems (p. 79), which has been hindering those countries in their reconstruction efforts. Progress in the rehabilitation of these systems now is reported from France, Western Germany, Austria, Belgium, Denmark, Holland and other countries. American equipment has helped to modernize some of the European systems.

HERE AND THERE IN INDUSTRY— Western Reserve Steel Co. may start production of steel (p. 72) at Madison, Ill., by Nov. 1 . . . . Direct reduction of iron ore is under way in an electric furnace pilot plant at Newcomerstown, O., by Cascade Iron Corp. (p. 73) . . . . Four Vermont machine tool builders will stage an independent show at their plants (p. 75) . . . . "Co-op Dollar Bills" are being distributed in Washington (p. 78) by business associations in a campaign against favored tax treatment of the co-operatives . . . . Russia has discontinued exports of manganese and chrome to this country . . . . Crosley has abandoned its engine built of brazed steel stampings in favor of a cast iron block (p. 83) . . . . Lukens Steel has closed its 120-inch plate mill for repairs (p. 86) . . . . A safety bureau in the Department of Labor is proposed in a bill now before Congress (p. 78).

AS THE EDITOR VIEWS THE NEWS

days, as provided in the Taft-Hartley Act. Mr. Truman would appoint a fact-finding board. While its findings would not be binding on industry, the union apparently feels its recommendations—presumably favorable to labor—would attract substantial public support.

This strategy may be sheer speculation, but it and the UEW pump priming argument suggest that the unions will meet employers' resistance with resourcefulness and cleverness. —p. 71

* * *

NO RECESSION IN AUTOS: Any reader who may be somewhat depressed by the current news of the business recession can gain a modicum of relief in "Mirrors of Motordom" in this issue. At the moment, automobile manufacturers exhibit no signs of uneasiness as to business volume. Everywhere in motordom the pressure is on for more production.

"Second shifts are being added to assembly lines, with some difficulty being experienced in obtaining a sufficient supply of experienced help. Many 8-hour shifts have been extended to 9 hours, although in one case union objections forced a cutback to 8½ hours. . . . Packard has increased daily assemblies. . . . Chrysler divisions have reached a postwar peak in production. . . . General Motors set a new all-time record in May. . . . Studebaker set an all-time record in May. . . . Kaiser-Frazer, while considerably off the pace of a year ago, has progressively improved its schedules. . . ."

All in all, motordom is building up a marvelous production record. Even allowing for setbacks later on, it has a fighting chance to make 1949 its banner year. —p. 83

* * *

TITANIUM TO THE FORE: From present indications, the metalworking industries henceforth will be more conscious of the merits of titanium and its alloys. Metallurgists know that the metal possesses many properties which make it a desirable construction material. Now that it can be manufactured successfully in ductile form, its production in quantity probably can be expected in the not-too-distant future.

Factors contributing to this promising development include an abundant raw material supply and three important properties of titanium, namely a relatively low specific gravity, good resistance to corrosion and high tensile strength. In competition with stainless steel, titanium has the advantage of light weight; in competition with light metals, its resistance to corrosion is favorable; and in competition with structural steels, corrosion resistance, lightness and possibly ease of surface hardening may prove to be the controlling factors. —p. 100

* * *

VERMONTERS ARE HOSTS: This week hundreds of users of machine tools from all over the country will visit the Springfield-Windsor machine tool area in eastern Vermont to view the products of four builders. The visitors will be met at the railroad stations at Albany, N. Y., and Charlestown, N. H., and conveyed by automobile to the builders' plants.

This idea is not entirely new. Individual companies have staged visitations of this kind on numerous occasions and now and then neighboring plants in different industrial groups have held "open house" simultaneously. This current Vermont hospitality probably is new in that four companies in the same industrial group have joined hands in playing host to customers and prospective customers.

Reporting this interesting visitation for this publication will be Machine Tool Editor Guy Hubbard. As a native of Windsor, he probably rates this as the most welcome editorial assignment he has had for a long time. —p. 105

* * *

WHY BASE PRICES HOLD: Some critics of the steel industry, who obviously are not too familiar with the price structure on finished steel, wonder why producers have not reduced base prices, as have sellers of certain nonferrous metals.

Apparently those who question the price policy do not realize that recently the prevailing base prices were considerably lower than premium prices obtained by many sellers. For several months, premium prices have been cut repeatedly, but they have not entirely disappeared. There is little inducement to reduce base prices as long as sellers are able to obtain higher, premium prices. Also the fact that sharp reductions in copper, lead and zinc have not attracted orders is a deterrent to cutting base steel prices at this time.

However, continued market weakness sooner or later will force lower base prices—probably after wage commitments are known. —p. 153

E. C. Shane

EDITOR-IN-CHIEF

News Summary

BUSINESS WEATHER—Although the volume of most metalworking industries, excepting automotive, has dropped rather sharply this year, production and shipments still are higher than in the better prewar years (p. 69). Steel production on a tonnage basis is about 50 per cent greater than the monthly average in 1937 and 1939 and about equal to 1941 output. Gear sales are well ahead of prewar years. Foundry equipment orders have picked up slightly from a low point reached in January and February. Employment is only slightly under the peak levels; unemployment has increased but is small compared with prewar normals.

FOURTH ROUND—Big Labor is meeting stern resistance to its demands for new wage increases, pensions and comprehensive social insurance programs (p. 71). General Electric has turned down the request of CIO electrical workers for a $500 annual package increase. Basic steel companies are cool toward demands of the United Steelworkers for wage increases and insurance programs. Some of the larger companies have indicated they will adhere by their contract provisions which exclude pensions as a bargaining subject this year. Metalworking companies having contracts with the steelworkers' union generally are waiting the outcome of negotiations between the union and U. S. Steel before signing new agreements. The possibility of strikes later in the summer should not be discounted too sharply, as the unions appear to be insistent on more concessions than industry is likely to grant in the face of declining business.

PRICING—Chances for passage of the O'Mahoney bill to legalize freight absorption in the absence of collusion appeared to be good late last week (p. 72). The measure would remove some of the confusion which has surrounded pricing policies since the Supreme Court outlawed the basing point system last year, but does not give blanket approval to a return to the former pricing policies of industry.

EXPORT MARKETS—Outlook for overseas sales of capital equipment continues good, according to trading authorities, who believe this is a strategic time for United States manufacturers to make a strong bid for foreign business (p. 74). American manufacturers now have a slight price advantage over European builders, although competition from countries rebuilt with ECA aid is expected to increase rapidly. Exports of all goods from this country are at a rate of $10 to $12 billion annually, more than twice the prewar average.

FOREIGN AID—As domestic business turns downward, congressmen are becoming worried over the lavish spending to aid foreign countries (p. 76). This attitude is reflected in mounting opposition to the Marshall Plan expenditures, the reciprocal trade program, and the International Trade Organization.

EUROPEAN TRANSPORT—One of the worst casualties of the war in Europe was the demoralization of transportation systems (p. 79), which has been hindering those countries in their reconstruction efforts. Progress in the rehabilitation of these systems now is reported from France, Western Germany, Austria, Belgium, Denmark, Holland and other countries. American equipment has helped to modernize some of the European systems.

HERE AND THERE IN INDUSTRY— Western Reserve Steel Co. may start production of steel (p. 72) at Madison, Ill., by Nov. 1 . . . . Direct reduction of iron ore is under way in an electric furnace pilot plant at Newcomerstown, O., by Cascade Iron Corp. (p. 73) . . . . Four Vermont machine tool builders will stage an independent show at their plants (p. 75) . . . . "Co-op Dollar Bills" are being distributed in Washington (p. 78) by business associations in a campaign against favored tax treatment of the co-operatives . . . . Russia has discontinued exports of manganese and chrome to this country . . . . Crosley has abandoned its engine built of brazed steel stampings in favor of a cast iron block (p. 83) . . . . Lukens Steel has closed its 120-inch plate mill for repairs (p. 86) . . . . A safety bureau in the Department of Labor is proposed in a bill now before Congress (p. 78).

Inland Steel, too, Is Made to *Your* Order

In preparing fine pastries, the baker's creative abilities are channeled according to your preferences. In like manner, your specific requirements govern the making of Inland steel. Furnishing job-fitted steel . . . acting quickly when fast action is necessary . . . is possible because Inland is a completely integrated producer, whose centralized facilities enable prompt decisions. And to every order are added friendly, personal interest and careful checking through each phase of production.

INLAND STEEL CO., 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

BARS • STRUCTURALS • PLATES
SHEETS • STRIP • TIN PLATE
FLOOR PLATE • PILING • RAILS
TRACK ACCESSORIES

. . . and
This "Inland Team"
Gives Your Steel
Their Personal Attention

METALLURGY SALES OPERATIONS

STEEL
A PENTON PUBLICATION

Volume Down, But Above Prewar

Steel production falling, but tonnage output is 50 per cent greater than weekly average for 1937 or 1939. Total employment near peak levels

METALWORKING executives concerned over the downtrend in business may find some comfort in the fact that today's volume is well above the better prewar years, although generally down rather sharply from the wartime and postwar peaks.

Steel production last week took its ninth consecutive dip, to 86½ per cent of capacity. Weekly tonnage output at this level, however, is about 50 per cent greater than the weekly average for either 1937 or 1939, about 23 per cent higher than in 1940 and on a par with 1941. Earlier weeks this year, of course, established alltime production records.

Auto Output Holds—Automobile production remains one of the brightest spots in the business picture. Assemblies of cars and trucks during the first five months this year and thus far into June have exceeded the average for any prior year. Easier steel supplies are helping automakers.

The Foundry Equipment Manufacturers Association's index in April was 172 per cent of the 1937-1939 monthly average. Foundry equipment sales are down sharply from last year, but April and March sales were trending upward from those of January and February.

Gear Sales Up—Gear sales are more than three times the 1935-1939 average. Monthly index of American Gear Manufacturers' Association for April was 339 per cent of the base period and is slightly ahead of April, 1948.

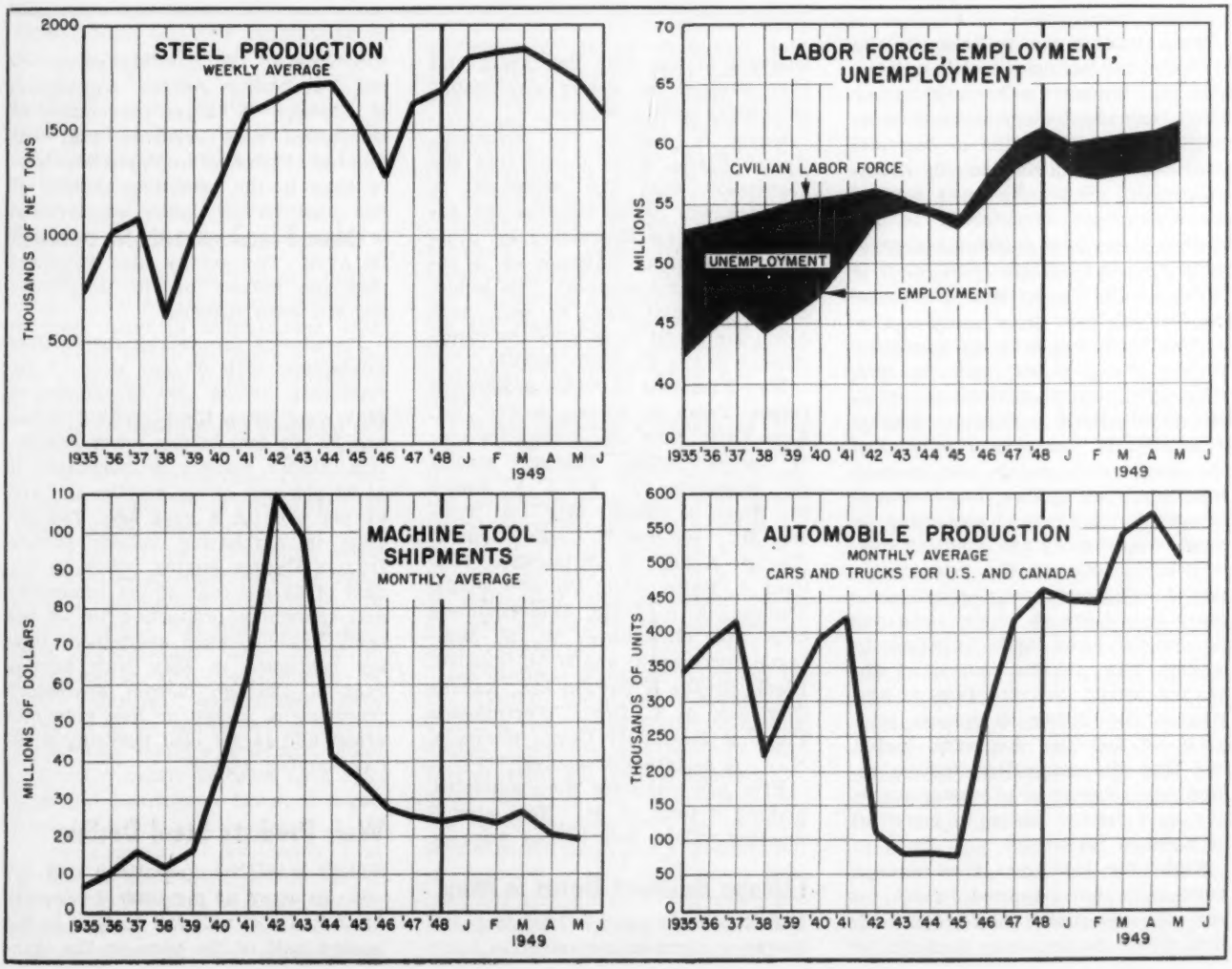
Machine tool sales, in dollar volume, currently are less than a fifth of the wartime peak, but are higher than the dollar volume for any time in the decade preceding 1940.

Employment Still High—While unemployment has been rising steadily this year and now stands at 3.2 million, 58.7 million men and women are still gainfully employed.

This is 8.4 million more than were employed in 1941 and more than 10 million above the average employment in any year prior to 1940. Today's employment is only 600,000 under the average for the peak year of 1948.

Unemployment of 3.2 million is a small figure compared with prewar years. More than 8 million were jobless in 1940. Ten million were out of work in 1938. From 1932 through 1934, 12 million or more were unable to find jobs.

The employment figures, compiled



by the government, are attacked by some of the metalworking unions as presenting too bright a picture. In all fairness it should be pointed out that an estimated 1.5 million workers are on a short work-week.

Recession Not Depression

That's unanimous view of speakers at meeting of National Industrial Advertisers

SPEAKERS addressing more than 1000 members of the National Industrial Advertisers Association meeting at Buffalo, June 12-15, were unanimously of the opinion business in the United States is in a recession —not a depression—which already has more than half run its course.

Three out of five industrial concerns have been "living" off inventories which now are close to minimum working levels. Consequently, an upturn in buying may be expected this fall.

Much of the shakeout in the current business adjustment has already occurred, in the opinion expressed by business paper editors discussing the situation at the meeting. The editors told the advertising men there are reasons why there need not be a severe recession.

Summarizing the outlook in the steel and nonferrous metal industries, Earl L. Shaner, editor-in-chief of STEEL, expressed the view production will continue to decline or lag and prices will be adjusted, mostly downward, until customers have worked off high-priced inventories. In his opinion if no new deflationary pressures are imposed this resumption of buying might occur before or near the end of 1949.

Steel producers now are operating at less than 90 per cent, he said, while producers of nonferrous metals are experiencing a sharp reduction in orders. In the case of steel and the nonferrous metals the present volume of new orders does not represent current needs of customers. In some cases buyers are awaiting lower prices. However, the price factor should not be overemphasized, since sharp reductions on copper, lead and zinc so far have failed to stimulate buying. This, in the opinion of Mr. Shaner, would indicate that at this stage of the adjustment process, price itself is not the dominant factor, and that the compelling motive behind the reluctance of customers to buy is a frantic desire to work off high-priced inventory.

Fight for Business—Even though business is not expected to dip too severely, advertising men present felt that it will be necessary to fight for business in the next few years and that support of strong advertising campaigns will be required.

David S. Austin, vice president, United States Steel Corp., told the convention that the salesmen of America will decide whether the future will bring depression or prosperity, inflation, deflation or a return to a sound economy. The sellers and commercial men, he said, once again are about to become the prime movers in the economic picture.

New President of NIAA is Bernard Dolan, Peter A. Frasse & Co. Inc., New York. New vice presidents are: H. James Christy, Eastman Kodak Co., Rochester, N. Y.; J. F. Apsey Jr., Black & Decker Mfg. Co., Towson, Md.; William D. Crelly, General Electric X-Ray Co., Milwaukee; William A. Bates, Steel Co. of Canada, Toronto; A. R. Tofte, Allis-Chalmers Mfg. Co., Milwaukee; W. B. Montague, Pittsburgh; and H. R. Waddell, Black, Sivalls & Bryson Inc., Kansas City, Mo. A. L. Davis, Worthington Pump & Machinery Corp., Harrison, N. J., is secretary-treasurer.

Five new chapters were admitted, making a total of 34. Next annual meeting will be held in Los Angeles.

NEW LOCOMOTIVE: This may look like a diesel-electric locomotive, but it isn't. It's the nation's first gas turbine electric locomotive. The gas turbine is similar in principle to that of the jet airplane engine. Developed jointly by American Locomotive Co. and General Electric Co., the locomotive has made satisfactory preliminary runs and is being assigned to the Union Pacific Railroad for additional tests in freight service. The 4500-hp locomotive weighs 500,000 pounds and is geared for a top speed of 79 mph. NEA photo

Chicago Business Down in May

BUSINESS dropped off in May following a slight improvement in April, according to the monthly survey of the Purchasing Agents Association of Chicago. A larger percentage of companies also reported that the number of persons employed was lower than in the preceding month, 47 per cent having lower employment in May compared with 37 per cent in April. The survey also indicated that the bottom of the downtrend has not been reached.

Inventories are falling faster than production with 62 per cent of respondents stating that inventories in May were below the preceding month and 50 per cent having lower production. Dollar volume of purchases is at 64 per cent of six months ago and 61 per cent of a year ago. The decline in purchasing volume results from a shorter buying policy on the part of 54 per cent of the companies and change in production by 36 per cent. Trend toward short-term buying continued in May with 53 per cent of Chicago district companies reporting a 30-day or less policy in effect and 44 per cent pursuing a 60-day buying policy.

Weir Predicts Steel Decline

STEELMAKING operations will decline to about 85 per cent of capacity by July 1 and will fall further in the second half of the year, in the opin-

ion of Ernest T. Weir, chairman, National Steel Corp., Pittsburgh.

Demand is off, he said, and the decline will become more pronounced during the remainder of the year. Backlogs of orders, he declared, are diminishing at a rate which probably will cause them to disappear altogether by mid-June.

The steel leader, commenting in a letter to stockholders, said nothing in these circumstances, however, gives cause for alarm. While demand and operations will be less than capacity, he anticipates a continuing demand for steel that will be sufficiently strong to maintain operations at a level which should make 1949 a good year.

Sees First Half Shipments Gain

"SHIPMENTS in the first half of 1949 will be 20 per cent ahead of the first half of 1948," John Lucas, president, Yoder Co., Cleveland, revealed at an open house held for suppliers, employees and their families June 10.

"For the year as a whole," he said, "shipments will exceed those for 1948 by about 10 per cent. A number of active new projects make prospects for the balance of this year appear fairly bright."

The Yoder Co. now is building a 16-in. pipe mill for Page-Hersey Tubes Ltd., Toronto; a 14-in. mill for Kaiser Co. Inc., Fontana, Calif.; a 20-in. welder for the Basalt Rock Co., Napa, Calif., and a 4-in. mill for an Italian company.

Propose Moses as Coal Leader

TO BRING about unity among northern soft coal operators and strengthen their hand in negotiations with the United Mines Workers, a permanent organization of those operators is being considered.

Asked to head up the proposed organization is Harry M. Moses, president of H. C. Frick Coal Co., Pittsburgh, coal-producing subsidiary of United States Steel Corp.

In addition to conducting labor negotiations and endeavoring to bring about a permanent stabilization in the bituminous coal industry the proposed organization would assist in interpretation and performance of labor contracts, particularly with reference to increasing safety in coal mines. The UMW's chieftain, John L. Lewis, recently testified at a congressional hearing in favor of legislation to improve mine safety.

It was reported last week that officials of U. S. Steel are in agreement with the plan to form the organization.

It is expected the organization would not be formed until later this year, too late for the 1949 contract talks.

Denials were made last week that the purpose of the plan is to establish a czar, or limit production or create an industrial monopoly. The purpose, it was said, is to bring order and dignity into labor relations of the bituminous coal industry and to avoid the chaos of strikes often attending the soft coal labor negotiations.

The proposal will be investigated this week by the small business subcommittee of the Senate Banking Committee. The subcommittee will examine the plan for possible violation of the antitrust laws and will seek to determine whether the interests of the small operators would be protected.

Hold Wage Line

Unions meet stiff resistance to demands for higher rates, pensions and social insurance

BIG LABOR is meeting stiff resistance to its demands for fourth round wage increases, social insurance and pension plans.

Industry will make another attempt this year to hold the wage line. Such an attempt almost succeeded last year when the basic steel companies and large electrical equipment manufacturers turned down third round wage increase requests and made the refusal stick until the line was broken in the auto industry.

Today, with volume falling and pressure for price reductions increasing, industrial executives believe they have a better case for holding the wage line than a year ago, when demand still exceeded supply and when the price trend was still upward.

Unions Insistent—Leaders of the steel, auto, electrical workers and the coal miners, however, will test the resistance of industry thoroughly. Union demands call for a wage increase of around 15 cents an hour, pensions of $100 to $150 a month at retirement ages of either 60 or 65, and comprehensive social insurance programs.

GE Refuses Package—Demand by the United Electrical Workers for a $500 a year increase, divided among wages, insurance and pensions, was turned down by General Electric Co. after the first day of negotiations. The union argued such an increase would serve as a pump primer and stimulate sales and business in general. GE officials said they could not accept this theory and contended that the majority of people have plenty of buying power already. What they are waiting for now are lower prices.

Steel Talks Under Way—Basic steel companies have indicated they will resist wage, pension and insurance demands of the United Steelworkers. Negotiations between the U. S. Steel subsidiaries and the union got under way last Wednesday in Pittsburgh. Discussions also have been started with some of the other companies, although these are likely to be recessed pending a settlement between the steelworkers and U. S. Steel.

No early agreement is anticipated in either industry or labor quarters.

Among the more interesting speculation heard late last week was the following: If no agreement is reached as the July 16 deadline approaches, Philip Murray, president of the United Steelworkers, will declare he intends to call an industry-wide strike and will petition President Truman to declare a national emergency for 80 days, as permitted under the labor-hated Taft-Hartley Act.

This would give Mr. Truman an opportunity to pay back labor for support in the 1948 election. He would appoint a fact-finding board, members of which would be hand-picked to make recommendations favorable to labor, a procedure used in 1946.

While the findings of the fact-finding board would not be binding on industry, the union reasons that such recommendations would exert considerable public pressure and thus enable the union to gain more than it otherwise could at the bargaining table.

Fabricators Delay Action — Steel fabricating companies having contracts with the United Steelworkers, in agreement with the union, have postponed their negotiations until a settlement is reached between U. S. Steel and the union. During the past several years, these nonbasic steel or fabricating companies have argued that their negotiations should be divorced from those of the basic steel industry. This year, they apparently intend to use the U. S. Steel settlement as a yardstick.

Coal Stoppage Uneventful — Coal mines were idle last week as John L. Lewis kept the miners out in an effort to reduce the stocks of coal above ground.

The stoppage caused little concern among the steel and metalworking companies which generally are well supplied with coal. The miners will start their annual 10-day vacation June 25, and some are expected to stay out of the mines all of this week. If a new contract is not signed before the miners' vacation ends July 5, the mines will continue idle.

Pricing Bill Chances Good

May be passed by House in much the same form in which it was approved by the Senate

CHANCES appear good that the Senate-approved O'Mahoney bill legalizing freight absorption in quoting competitive prices in the absence of collusion will be passed by the House about in the form it went through the upper house. This despite the vigorous objections of a number of influential representatives, including Wright Patman (Dem., Tex.).

The House Judiciary Committee put off until Tuesday of this week the final vote on the measure but Representative Walter, who heads the committee, predicted that the bill would be reported favorably and about in its original form.

Remove Confusion—The proposed law is designed to remove the confusion attending pricing resulting from Supreme Court decisions banning basing point and similar pricing. However, the feeling persists among industrialists, including steel producers, that while the proposed measure will help some it does not by any means give blanket approval to a return of former policies.

The measure, if passed, will: 1. Permit uniform, nationwide or intrazone delivered prices so long as such are not arrived at through collusion and do not restrain trade; 2. give manufacturers a defense against antitrust law prosecution in instances where they reduce prices by absorbing freight to meet competition in good faith; 3. not provide a defense in cases of price fixing; 4. not protect a company which consistently undercuts a competitor with the purpose of putting the latter out of business; 5. provide leeway for future Justice Department suits in cases of law violation, but specifies that delivered prices or basing points, in themselves, are not illegal so long as they are not used for monopolistic or oppresive purposes.

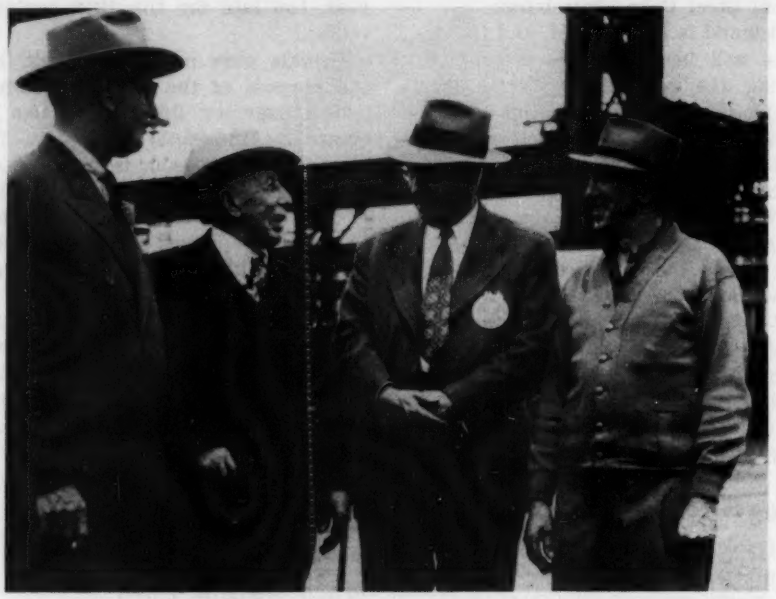
Approval Delayed—Delay in approving the bill by the House Judiciary Committee last week was caused by Representative Patman who asked for time to prepare an analysis of the measure. When he appeared on Tuesday to oppose the bill he failed to include in his statement any expressions from members of the Federal Trade Commission, evidently for the reason that the commissioners offer no opposition. The only FTC man quoted by Representative Patman was Walter Wooden, assistant general counsel.

Perhaps the most important development last week in connection with the O'Mahoney measure was the announcement by Representative Celler (Dem., N. Y.) that Dr. John D. Clark of the President's Council of Economic Advisers supported the bill and urged speedy action. This led to speculation in some circles as to whether Dr. Clark was concerned that the continuing confusion over pricing might be helping the business decline along.

Representative Celler said that with Dr. Clark and the Justice Department favoring the bill he could not agree with Representative Patman's claims that the measure scuttles the anti-trust laws.

Relief Uncertain—To what extent the new bill, if and when passed, will answer the pricing problem confronting the steel industry, no one of authority in the industry at this juncture is willing to say. It is pointed out by some observers that the new measure does not in any way change the basic anti-trust law provisions authorizing suits for price fixing conspiracies. Some seem to think the new law strengthens the Federal Trade Commission's hand in this respect.

In any event, even though the O'Mahoney bill is enacted into law, it is certain that under existing conditions complete return to basing point pricing in the steel industry is out of the question.



OLD TIMER: Guest of honor at American Bridge Co.'s open house at Gary, Ind., plant was 88-year-old Peter Weber, second from left, who supervised the construction of the Gary plant in 1909. Mr. Weber retired in 1931. Also shown in photo are, left to right: Arthur C. Wilby, vice president, U. S. Steel; Frank K. McDanel, president of American Bridge; and Paul H. Weber, the guest of honor's son, who is superintendent of buildings and grounds at Gary

Output May Start Nov. 1

Western Reserve Steel, new company, to restrict initial production to seamless tubing

PRODUCTION by the new Western Reserve Steel Co. at Madison, Ill., may get underway by Nov. 1, it was learned last week from the firm's president, Harry H. Holloway, Cleveland. Arrangements for financing were expected to be completed last week.

Initial production will be confined to oil country seamless tubing but the company is contemplating broadening its operations later to production of tin plate, sheet, strip, plate and large-diameter welded pipe made from plate.

Four 80-ton capacity electric furnaces will provide steel for the tubular goods, and if the company enters the field of flat-rolled products an additional four electric furnaces will be installed. Being of top-charging type and 18 feet in diameter, the furnaces will provide considerable flexibility as to the size of scrap that can be charged into them.

Easing in demand for steel is not deterring the company in its plans to enter business, for Mr. Holloway believes it will enjoy a substantial competitive advantage by being able

to ship by water, inasmuch as the plant is located on the Mississippi river. Furthermore, Mr. Holloway foresees a continuing demand for pipe to replace the networks of aging pipes in the cities.

Low Cost Operations—Giving Mr. Holloway further confidence in the future for the new plant is the fact, he said, that it is being designed to operate profitably at as low a rate as 50 per cent of capacity.

Aiding substantially in achieving low-cost operations will be elimination of the conventional blooming, billet, and bar mills. In making pipe the company will produce a small ingot which will be cut in two by torch. Each of two resulting slugs will go directly into a mill to be pierced and transformed into seamless pipe. If the company eventually expands into the flat-rolled field, it will pour slabs from which the products will be rolled.

Elimination of some of the rolling processes will be made possible by the use of high-quality, conditioned ingots produced by the bottom-pouring method.

All of the methods to be used in the plant are being followed successfully somewhere today, Mr. Holloway said.

The Western Reserve Steel Co. obtained the plant early this year from the War Assets Administration. The plant, built in 1942, was operated during the war by General Steel Castings Corp.

Direct Ore Smelting Reported

SMELTING iron ore by direct reduction process is reported being accomplished at a pilot plant near Newcomerstown, O., by the Cascade Iron Corp., a new Ohio firm.

Powdered iron ore and limestone are charged into a shaft-type furnace having three carbon electrodes near the hearth. Preheated air blown through the shaft keeps the charged materials in a state of agitation. Reaction between the gases and the burden causes globules of sponge iron to drop into the hearth where it is kept in a molten state for tapping by the heat given off by the electrodes.

At present local iron ores, known as "black band" and containing a high percentage of carbon, are being used. Future plans call for use of Mesabi ores and powdered coal.

Advantages claimed for the process are: Lower handling costs, recovery of by-product gases, use of lower cost coal than is employed for making blast furnace coke.

The method and equipment were devised by T. F. Baily, Canton, O.

Farm Machine Needs Fall

Record postwar output fills big demand. Future buying seen lagging moderately

OUTPUT of farm machinery in the first half of 1949 will be even greater than in the same period in 1948, a year when production was at least a fifth above the previous record of 1947, according to Albert P. Brodell, Bureau of Agricultural Economics.

During the last half of 1949 and in 1950 farmers are likely to buy moderately less machinery, equipment and repair parts than in the last six months of 1948.

Such factors as increases in plant facilities and larger supplies of labor and materials are responsible for the filling of the war-created backlogs.

Exports Greater—As production of farm machinery has been increased—in 1947, alone, it was 2½ times the 1935-1939 average—larger quantities have been shipped abroad. Exports in 1947 and in 1948 made up about a sixth of output. Almost a fourth of last year's exports went to ECA countries and their dependent overseas territories, but exports in 1949 may fall short of the 1948 record.

Imports of farm machinery, mostly from Canada and the United Kingdom, also have increased. Last year's volume was ten times above the prewar average although it made up only 4 per cent of the quantity available to U. S. farmers.

The large output of farm machinery last year found a ready market. About 450,000 wheel tractors were sold in the U. S. More than 95 per cent were bought for farm use. Wheel tractor production amounted to about 530,000. About 100,000 were exported. Imports totaled a record 25,000 units. The 40,000 crawler tractors produced in 1948 exceeded the 1947 output but was less than in 1944-45 when much of production was for military use.

More Garden Tractors—About 180,000 garden tractors came off assembly lines in 1948, about 7000 more than in 1947 but more than 20 times the average prewar output. In 1948 farmers bought one new combine for every six on farms that year. Production of combines totaled about 90,000. Twelve thousand were exported, and 10,000 were imported from Canada.

Farm machinery production, large in each year of the past decade except 1943, has been stimulated by the rapid mechanization of farms. In each year not more than 100,000 tractors are likely to be scrapped but 150,000 may be needed to replace work animals. Farm purchases in 1949 probably will exceed these basic requirements.

Farmers have scrapped only a small proportion of their tractors since 1940, and many of these are more than 15 years old.

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production	Number of weeks in mo.
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427 *	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
*Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
†May	6,984,815	96.9	400,741	90.9	297,872	57.4	7,683,428	94.1	1,734,408	4.43

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

Exports Seen as Sales Boosters

Outlook good for capital goods, poor for consumer items. Foreign trade authorities, however, cite need for permanent programs for successful overseas commerce

U.S. MAKERS of capital equipment can bolster domestic sales by inaugurating a permanent export program. Overseas markets for this category of equipment are still good, although the outlook for consumers' goods is poor. This is the consensus among individuals surveyed by STEEL in industry, foreign trade associations and government who are close to the problem.

Now is a strategic time for capital goods manufacturers to begin a permanent export program or to increase their present exports, according to Charles J. Ewald, executive director of the Cleveland World Trade Association, an affiliate of the Cleveland Chamber of Commerce. If more American goods aren't soon placed on the world market, he fears the demand peak will have passed, with a disproportionate amount of the contracts going to British, Belgian, German, Swedish and French competitors.

U.S. Prices Lower—R. W. Gresham, secretary-treasurer of A. W. Fenton Co. Inc., Cleveland, ocean freight and custom house brokerage firm, points out that in the near future ECA assistance will have put European industry back on its feet so that foreign competition will be even stiffer than it is now. Foreign capital goods prices are currently slightly above American, but they will fall below U.S. quotations once European recovery has been completed. Before the war most European price levels on such equipment were under the American figures.

Canada remains the best market for American goods, followed by the United Kingdom. Other good markets —with import restrictions—are Belgium, France, Italy, Sweden, Greece, Colombia, Peru, Bolivia, Chile, Ecuador and the Arab nations of the Middle East. Lively customers also are Venezuela, Cuba, Dominican Republic, Haiti, Guatemala, Netherlands West Indies and Switzerland, the only areas left in the world which do not have import restrictions. The Union of South Africa, formerly free, imposed restrictions June 1.

Information Available—Firms investigating export possibilities may obtain information from local banks, local foreign trade associations usually connected with chambers of commerce, one of the 42 regional representatives of the Commerce Department's Office of International Trade or combination export manager firms which act as export departments for small companies.

A metalworking company just entering the export field may expect to lose money the first year of its foreign sales efforts, unless it makes an exceptionally good or original product. Lucian J. DeMore of World's Products Trading Corp., Cleveland, a combination export manager organization, estimates that it takes his company from 9 to 12 months to develop contacts supplying business for the average product. Mr. DeMore emphasizes that any export program to be successful must be on a permanent basis.

U.S. Exports Still High—Although declining from postwar peaks experienced in 1947 and 1948, U.S. exports are still running at the rate of between $10 billion and $12 billion annually, compared with an average of $4.9 billion for 1937-1939. American business abroad reached $12.6 billion in 1948, $15.3 billion in 1947, $6.7 billion in 1929 and $9.5 billion in 1919.

A strong capital goods market is expected to hold, however, because of the tremendous demand, dollar supplies which still remain in many foreign countries, dollar revenues anticipated from a record American tourist trade in Europe this summer and gradually increasing familiarity with the intricate regulations affecting foreign trade.

NEW ROLL SHOP: When completed in mid-summer the new roll shop at Bethlehem Pacific Coast Steel Corp., Los Angeles, will service all rolling mills in the plant. It will be a third larger than the old shop and will include a 44-inch roll lathe, five 18-inch roll lathes and a 32-inch engine lathe. A new tool and template shop will be operated in conjunction with the roll shop

March Steel Exports Up

DECLINE in steel exports was halted, at least temporarily, in March as the total for that month rose to 406,093 net tons, up more than 54,000 tons over February's aggregate and the highest for the year to date.

(Net Tons)

	February	March
Semifinished	20,623	33,991
Iron and steel bars	44,836	42,943
Sheet and plates	129,157	161,490
Structural shapes	38,966	38,627
Railroad supplies	36,243	24,127
Tubes, pipe, fittings	52,263	69,480
Wire products	23,739	29,014
Nails, other fasteners	5,916	6,421
Total	351,743	406,093

Steel Exports Rise to Americas

LARGEST share of United States steel exports in 1948 went to countries in North and Central America and the West Indies, according to American Iron & Steel Institute.

It was the first year since 1939 that these countries, as a group, had held first place. South American nations ranked second. Europe, for eight consecutive years the largest

consumer of steel exports from the U. S., droppd back to its prewar position of the third largest market. Asiatic countries, which received the largest percentage of iron and steel exports during 1935-1939, were the fourth largest market last year. Africa continued to rank fifth. Australia and Oceania continued to take the smallest part of the exports.

U. S. iron and steel exports totaled 4,697,405 tons last year, according to figures from the Department of Commerce.

Seek Prop for Slow Sales

Machine tool builders form company aimed at Latin American market

FACED with a diminished demand for machine tools, the nation's builders are turning to new fields and intensified promotion to spur lagging sales. Hope still runs high in the industry that there will be a marked improvement in orders this fall but there is no tangible evidence of any pickup as yet.

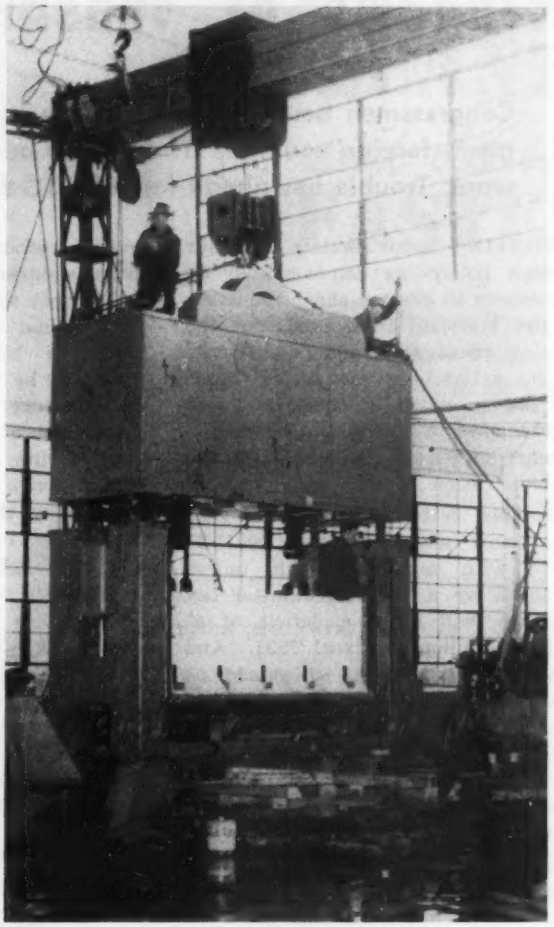
Although inquiries were brisk in recent weeks, very few orders resulted.

Foreign Orders—Foreign business, on the other hand, has picked up since the first of the year and considerable thought and effort are being devoted to expanding the export market still further. A recent development in this direction was the formation of Amertool Services Inc. by 11 machine tool builders. The new firm which will have temporary headquarters in Cincinnati has as its aim the supply of underdeveloped Latin American countries with machine tools.

Charter members of Amertool include six Ohio companies: Monarch Machine Tool Co., Sidney; Hydraulic Press Mfg. Co., Mt. Gilead; Thompson Grinder Co., Springfield; and three Cincinnati firms, Cincinnati Lathe & Tool Co., Cincinnati Milling & Grinding Machines Inc. and Fosdick Machine Tool Co. Other members are: National Automatic Tool Co., Richmond, Ind., and four New England companies, Blanchard Machine Co., Cambridge, Mass.; Heald Machine Co., Worcester, Mass.; Jones & Lamson Machine Co., Springfield, Vt.; and Cone Automatic Machine Co. Inc., Windsor, Vt.

Original capital for the company is reported at $500,000 with shares selling at $500. Also, with the filing of the articles of incorporation, a $3 million loan was granted by the Export-Import bank.

Meanwhile, four Vermont machine tool builders are collaborating in an effort to bring in lagging orders. Bryant Chucking Grinder Co., Fellows Gear Shaper Co., and Jones & Lamson Machine Co., all of Springfield, and Cone Automatic Machine Co. Inc. of nearby Windsor are jointly sponsoring an independent show at their respective plants, June 20-24.



NEW PRESS: A 300-ton capacity Verson press is shown during installation in the new factory of the Nineteen Hundred Corp. at St. Joseph, Mich. The new press department will include 75 machines, of which 22 will be new units, and will eliminate the need for farming out press work

Enters Reinforcing Business

UNITED States Steel Supply Co., U. S. Steel subsidiary, has entered the concrete reinforcing bar fabricating business in Cleveland, Boston, Pittsburgh, Chicago and St. Paul. The company has been operating its new division for several months and has assembled an experienced organization.

Radio Frequency Shaft Hardening

INDUSTRIAL Electronics Division, Westinghouse Electric Corp., held an advance showing of a horizontal scanner for industrial radio frequency shaft hardening at its Detroit plant on June 13. The unit which requires manual refilling of the magazine holding parts to be hardened only at 8-minute intervals was designed for use by an automobile builder and can handle 12,000 shifter rails in 16 hours of work.

Since four types of shifter rails will be handled by the scanner, magazines have been designed so that only the right part can pass through for any setting of the machine. Setup time is reduced by the use of four timers, each preset to the proper cycle for one of the four types of rails.

Form Tool & Die Concern

FORMATION of a single tool and die and contract manufacturing concern by seven Connecticut companies will offer a broader service to both private and government purchasing agencies, according to officials of the new firm, Connecticut Mechanical Industries Inc., Hartford, Conn.

President of the new concern is John H. Dowd, president, Johns-Hartford Tool Co. Other officers and directors are officials of Argus Engineering Co., Grandahl Tool & Machine Co., Arrow Tool Co. and Swan Tool & Machine Co., all of Hartford, and Cooperative Tool & Machine Co. and Lake Tool & Machine Co., both of New Britain.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Congressmen becoming worried over amount of aid being given foreign countries as domestic business trends downward. Trouble lies ahead for ERP, ITO reciprocal trade

MOUNTING dissatisfaction with our foreign policy—as demonstrated by the efforts to effect a sharp reduction in the Marshall Plan funds for the coming fiscal year, and as reflected by the active opposition to extension of the so-called Reciprocal Trade Agreements Act for three years—presage increased difficulties for the administration in this category.

Trouble certainly is due a year from now when Congress will be faced with demands which, unless financed by a very substantial tax increase, will mean a deficit of at least $7 billion in fiscal 1951. And that estimated deficit, it should be borne in mind, covers only a projection of the existing budget and does not include the vast amounts that the proposed health, social security, housing and other pending programs would add to the necessary outlay.

Congressmen who are increasingly worried about fiscal affairs include not only Republicans and southern Democrats, but many of the Truman Democrats from the northern states. Every time they hear about a further down movement in the business curve they get renewed jitters. So more serious thought is being devoted to scanning the budget—to see where some real savings can be made—and there is a growing feeling that possibly the best way of effecting substantial economies is to cut down the flow of dollars which are being donated here and there to the many "friendly" nations.

Opposition To Increase—Paving the way for more vociferous opposition later on, the three main prongs of our present foreign policy have been under attack in Congress lately as follows: 1. The Reciprocal Trade Agreements Act is held to be tending in the direction of free trade without proper regard to the welfare of American industry; 2. under the Marshall Plan, it has been declared in Congress, the United States pays out billions each year to make up the trade-balance deficits of the participating European nations; 3. and the International Trade Organization has been described as a combination of 58 nations, in which the United States has only one vote though it carries the great portion of the economic load, which meets each year to distribute surplus production and allocate the world's markets.

To meet this situation Sen. George W. Malone (Rep., Nev.) has introduced a bill which merits some thought; he put it in the hopper as a substitute for proposed three-year extension of the Reciprocal Trade Agreements Act. This substitute bill would revive and reinvigorate a tariff philosophy that dates back to 1922. It provides for "flexible import fees," or tariffs, that would be the difference in cost of foreign products delivered in the United States and the cost of producing these same products in the United States at our prevailing wage rates.

Tied to Living Standards — Prime purpose, of course, is to protect our home standard of living against the depressing effect of imports produced in countries where the standard of living is lower. But, while retaining this "peril point" idea, the Malone bill would welcome imports to enable the foreign countries to get dollars to pay for United States goods. And the fees would be adjusted downward as foreign countries raised wages and improved their standards of living—and "when their living standard approximates our own, free trade will be the immediate and automatic result."

An important feature is the discouragement of foreign countries from seeking trade advantages through currency manipulation; the bill provides that when countries devalue their currency for this purpose they will be faced with an immediate increase in the import fees they will have to pay to get their goods into the United States.

Measures such as the Malone bill stand little chance in the present session, but the trend of thinking in Congress is in that direction.

Canada Supplies Half ECA Metals

CANADA has supplied 50 per cent of the nonferrous metal for which the Economic Cooperation Administration authorized procurement during the first year of its existence, Apr. 3, 1948, through Mar. 31, 1949.

Total authorizations for nonferrous metals came to $304,526,000, of which $150,556,000 was assigned to Canada as the country of origin of the metals. Other authorizations, by countries of origin, were: United States $71,251,000, Latin America $70,117,000, Belgium $5,710,000, Japan $1,860,000, Netherlands $1,022,000, Italy $902,000, Union of South Africa $893,000, Norway $609,000, China $499,000, United Kingdom $468,000, Switzerland $250,000, British dependencies in Asia and Oceania $206,000, Yugoslavia $133,000, Bizone Germany $50,000.

Breakdowns, by countries from which shipments were to be made, were:

Aluminum, Aluminum-Base Alloys—Canada $56,140,000, United States $793,000, Switzerland $70,000.

Copper, Copper Products — Latin America $50,126,000, Canada $45,505,000, United States $39,396,000, Belgium $3,964,000, Switzerland $180,000, Yugoslavia $11,000.

Brass, Bronze Products — United States $5,891,000, Canada $512,000.

Lead, Lead-Base Alloys—Canada $22,954,000, Latin America $17,738,000, United States $2,559,000, Belgium $1,184,000, Union of South Africa $893,000, Italy $448,000, Yugoslavia $122,000.

Nickel, Nickel-Base Alloys—Canada $3,787,000, United States $613,000, Norway $609,000, United Kingdom $469,000.

Tin, Tin-Base Alloys—Netherlands $1,022,000, China $300,000, British dependencies in Asia and Oceania $206,000, Belgium $162,000, United States $34,000.

Zinc, Zinc-Base Alloys — Canada $21,362,000, United States $18,524,000, Latin America $2,199,000, Japan $1,860,000, Italy $455,000, Belgium $358,000.

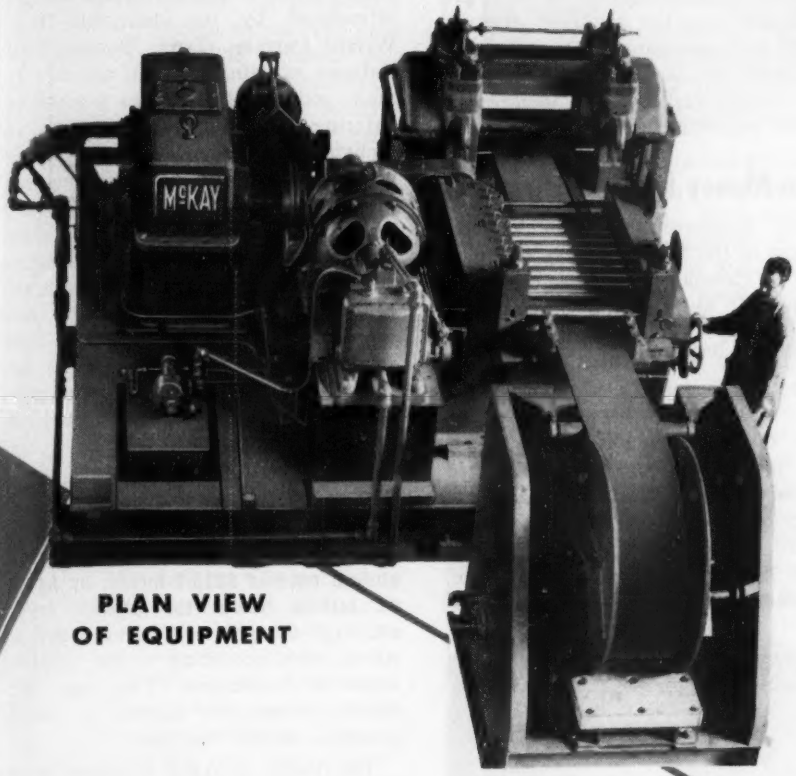
Precious Metals, Miscellaneous — United States $3,441,000, Canada $298,000, China $199,000, Latin America $55,000, Bizone Germany $50,000, Belgium $43,000.

Want Scrap Export Limits Lifted

"OPEN-ENDING" of ferrous scrap exports is under consideration by the Office of International Trade as a result of complaints from scrap interests who point out that quantitative restrictions have been removed from nearly all rolled steel products. The scrap dealers ask why the OIT picks on scrap. Scrap dealers say that the domestic inactivity in the scrap market threatens maintenance of their collection machinery, and they want to be free to export scrap. The steel industry opposes the proposal on the

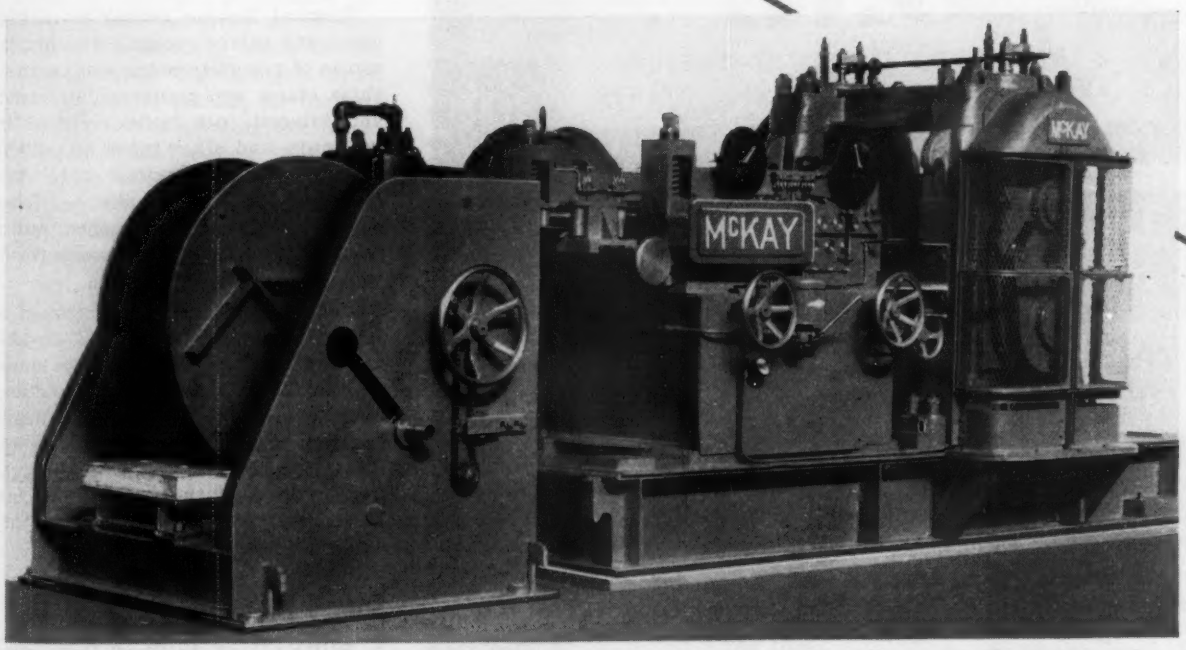
McKAY

Will cut it CLEANER *and do it* FASTER



PLAN VIEW OF EQUIPMENT

- A Roller Leveler and Rotary Drum Type Shear, (Utilizing Geneva Motion) are combined to produce cut to length strip from the coil.
- Extreme accuracy is developed through use of fluid drives and differential hydraulic speed control.
- Delivery speed 100 to 300 feet per minute.
- Lengths are variable from 2 to 20 feet.
- Compact design minimizes floor space.
- Rugged construction insures continuous performance.
- Leveler capacity 16 gauge to 1/4" thickness — SAE 1020 steel.
- Shear capacity 1/8" x 24" or 1/4" x 12" — SAE 1020 steel.
- Engineered for low cost high speed production.



The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

ground that there is no real surplus of scrap in the United States. Recently the OIT set second and third quarter export quotas of ferrous scrap at 40,000 tons each, mainly to take care of requirements of consuming plants in Mexico and Chile that historically have obtained their scrap from the United States. Under consideration is the question as to how much scrap for Argentina will be permissible under this quota limit; several applications for export licenses for small tonnages for Argentina have been received.

Spy Trial Reveals Laxity

DISCLOSURE in the Judith Coplon espionage trial of the neat way in which the Russians circumvented export restrictions was a rude shock to security officials and is expected to have repercussions. Just how it was done has not yet been figured out—but it is known that a batch of atomic energy instruments, made by the Cyclotron Specialties Co. under contract with Amtorg Trading Corp. left New York on Aug. 21, 1947, aboard the ship *Mikhail Kutuzov* and arrived in Russia. Included were Geiger-Muller counters, ionization chambers, electroscopes and others all on the semi-restricted list. Clearance was given at the same time to another shipment of such instruments in September of 1947, but the instruments were removed from the steamer *Murmansk* before it cleared from New York.

Fortunately, according to qualified spokesmen, none of the instruments shipped are real "atomic energy secrets," since thousands of them are in use all over the country. But officials and members of Congress are disturbed over a lax setup which permits smart exporters to violate the export regulations.

Save Money by Rebuilding Cars

ARMY purchases of motor vehicles for use in the United States occupied zone in Germany have been held to negligible numbers by rebuilding used units. For an outlay of approximately $35 million, equipment whose replacement value today is $220 million, has been restored to good operating condition; each vehicle is stripped and reassembled to the last rivet. The work has been going on since April 1, 1947, during which time 38,000 vehicles of all types have been rebuilt. In addition, thousands of engines, transmission assemblies, axles and other parts have been rebuilt and returned to depot stocks.

Asks Aid For Small Business

BILL to provide "that small business shall receive a fair share of government procurements," identified as H. R. 4760, has been approved by the House Small Business Committee and introduced by its chairman, Rep. Wright Patman (Dem., Texas). Mr. Patman explains it as an attempt to make existing laws more definite in catering to small business, also to include all procurement agencies which have not heretofore received mandates to place a portion of their requirements with small business. Under the new Patman bill all agencies that engage in procurement are called on to "issue regulations and prescribed conditions to the end that small business concerns will be assured of a fair and substantial portion of the procurement of services or supplies by it."

Personal Income Declines

PERSONAL income declined to an annual rate of $213.7 billion in April, $1 billion below the March level, although 2.5 per cent higher than in April, 1948, according to the Department of Commerce. This was the fourth consecutive month in which personal income declined.

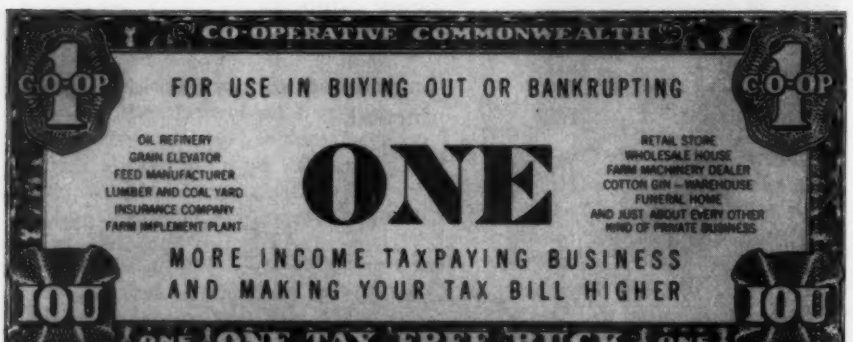
The decline in April stemmed from lower farm income. Nonagricultural income was approximately stable.

Personal income estimates include wage and salary receipts, the net incomes of proprietorships and partnerships (farm and nonfarm), dividends and interest, net rents received by landlords, and other types of individual income. The annual rate data represent the seasonally adjusted dollar totals for each month multiplied by 12 to facilitate comparisons with previous annual totals.

Manufacturing wages continued to fall in April, with both the durable and nondurable goods industries showing employment declines and reduced hours of work. The drop from March to April was about the same as the average monthly decline during the first quarter of the year. From last November through April, factory wages declined 10 per cent.

Safety Bureau Proposed

A BUREAU of Accident Prevention would be established in the Department of Labor in the event of enactment of a new bill introduced by Rep. Thomas H. Burke (Dem., O.).



CO-OPERATIVE COMMONWEALTH
CO-OP
THIS CERTIFIES THAT WE THINK EVERYBODY SHOULD PAY TAXES EXCEPT US CO-OPS
U PAY 'EM.....WE DODGE 'EM
Federal Income Taxes
IN TAX EXEMPTION WE TRUST
THIS CO-OP BUCK HAS NO FEDERAL OR STATE INCOME TAX LIABILITY
ROSES ARE RED VIOLETS ARE BLUE, CO-OPS DODGE TAXES WHY CAN'T YOU!
Comptroller
Treasurer
100
ONE TAX FREE BUCK

RIDICULE CAMPAIGN: This is the new "Co-op dollar bill" which is flooding Washington in a renewed fight by many associations of business men against the favored tax treatment extended to co-operatives under existing laws. To correct this situation, Rep. Noah Mason (Rep., Ill.), a member of the Ways & Means Committee, has introduced a bill "to close the loophole" by which co-operatives escape normal state and federal taxes

Europe's Transport Up

Rail freight traffic heavier; more oil used than prewar in air, sea, highway commercial traffic

EUROPE is moving toward recovery on a revitalized transportation system.

French railroad freight traffic averaged 3,437,000,000 ton-kilometers per month in 1948, a 56 per cent gain over comparable 1938 figures. For other countries the ton-kilometer gain in 1948 over 1938 was: Austria 55 per cent, Belgium 20 per cent, Denmark 41 per cent, Hungary 25 per cent, Holland 25 per cent, Czechoslovakia 19 per cent. In the United States the ton-mile monthly average about doubled from 1938 to 1948.

Maintenance Lags—This showing was made despite war damage still unrepaired to tracks and bridges and shortage of equipment. Maintenance and repair of freight cars continues to be a major problem. Only the Scandinavian countries, Finland and Switzerland show normal percentage of cars under and awaiting repair (compared with the total stock) of 2.5 to 5 per cent as was normal in prewar days.

Since February, 1948, little or no improvement has been made in the percentage ratios of unrepaired freight cars compared to total stocks in Belgium, Czechoslovakia, France, Italy, Luxemburg and the Netherlands. These countries still have 10 to 18 per cent of cars out of service because of defects. A notable improvement has occurred in Austria and Western Germany where the repair percentage has dropped from 25 to 18. Major reasons for the better ton-kilometer showing are faster turn-arounds and easing in prewar restrictions on interchange of cars among countries.

Oil Use Up—ERP participating nations are expected to use 48.7 million tons of petroleum products during fiscal 1949-50, much of which will be for road, sea and air transportation. This is equal to about 975,000 barrels a day, an increase of 57,000 barrels a day over the estimated 1948-49 consumption and 374,000 barrels over the prewar daily use. Use of oil in Western Europe for commercial transportation is now nearly 45 per cent higher than it was in 1938.

A 26,000-mile network of arterial roads across the continent and Britain may be built during the next ten years under an agreement reached at Geneva, Switzerland, after a year of negotiation. The system would be based on existing roads made uniform, with fly-over junctions and standard signals. The countries involved are France, Britain, Belgium, Holland, Austria, Denmark, Portugal, Finland, Greece, Luxemburg, Norway, Sweden, Switzerland, Czechoslovakia, Poland and Hungary. Three new treaties for signature at Geneva before the end of this month would facilitate motor travel across frontiers, reduce frontier restrictions on international road haulage and allow sealed trucks to pass intermediate countries in transit without customs examinations.

PROMISE MORE NATIONALIZATION: James Griffiths, chairman of the British Labor Party, is shown speaking at the party's annual conference in Blackpool, Eng. Seated on the platform, left to right, are: Herbert Morrison, lord president of British Housing Council; Prime Minister Clement Attlee; and Morgan Phillips, party secretary. Party members were promised that more British industries would be nationalized if the party won the next election and that permanent controls would be placed on private industry. NEA photo

France

FRENCH National Railroads have been experimenting with rolling stock on rubber tires, and one train has been in service since November, 1948. Two more trains have been ordered, one of six coaches in aluminum alloy.

The French railroads have reduced the freight rate on iron ore by 5 per cent for hauls of less than 100 kilometers, and smaller reductions have been made up to 200 kilometers. For iron and steel products a reduction of 9.5 per cent has been made, irrespective of distance.

French automobile production set a new record in April, with 15,220 passenger cars and 9176 commercial vehicles turned out.

French exports of iron and steel products during the first quarter of 1949 totaled 321,000 tons, nearly three times the tonnage exported during the same 1948 period. These exports consisted mainly of semifinished, merchant bars, structural steel and iron.

Western Germany

VOLKSWAGEN production reached 3454 cars in May, as against 3024 in April. Exports totaled 808 units, compared with 616 in April and 364 in March.

Of the 12 newly appointed German custodians for reorganization of the Ruhr steel industry, four represent trade unions, four public administration and four shareholders in the former private firms. Questions of ownership will not be handled at first; only technical efficiency considerations will come up for study at the present.

Pig iron production in May totaled 675,000 net tons, compared with 626,000 in April. Steel ingot output reached 848,000 tons, compared with 775,500 in April. The daily output was 4.4 per cent higher in May than in April for pig iron and 5.1 per cent higher for ingots. The official monthly target was surpassed by 13.8 per cent, a situation prompting renewed pressure on the Allies to boost the steel production ceiling of 12.2 million tons to about 15 million tons annually. Much is made of the U. S.'s lifting of all production ceilings in Japan.

Greece

RECONSTRUCTION of essential Greek transportation facilities has been completed in 20 months under U. S. Army supervision, at a cost of $29 million in American currency.

About 1000 miles of first-rate highways have been constructed to link the important cities and mountainous regions of Greece, while rebuilding of the ports of Piraeus, Salonika and Volos required construction of more than 2 miles of concrete quays, two large dry-docks, breakwaters and installation of permanent port equip-

ment. More than 2 miles of bridges and railroad tunnels have been built, and the 4-mile Corinth Canal, closed by German demolition in 1944, has been reopened. Seven airfields have been constructed.

Austria

ECA WILL help finance a new continuous billet mill at Donawitz and rehabilitation of the Erzberg iron ore field, Styria, Austria.

The new Donawitz mill will handle semifinished products now rolled on outdated, inefficient equipment. In conjunction with use of existing equipment at this site, it will furnish capacity to roll 33,000 tons of semifinished and finished per month, against the present capacity of 25,000 tons per month. The project will cost $7,230,000, including $3,451,000 from ECA and the remainder from local funds. The mechanical and electrical equipment and parts for the mill will be purchased in the U. S.

At Erzberg, 1948 iron ore output was only 980,000 tons, compared to an average prewar production of 2 million tons annually. The mining, concentration and transport equipment necessary to the rehabilitation projects is expected to increase present output by 57 per cent, increase the labor force 19 per cent and bring lower mining costs per ton.

Industrial Relations

In many instances out of date at time when they are all important, steel founders told

WITH labor costs a principal obstacle to reducing prices, the industrial relations field is one to which industries should devote all-out attention in an effort to readjust successfully to the downward trend of business. Many industrial relations policies are out of date.

These were conclusions drawn from a talk at Chicago before the second annual industrial relations conference of the Steel Founders' Society of America by Albert Ramond, Albert Ramond & Associates, Chicago.

Discussing "A Practical Evaluation of Industrial Relations—Increasing Man-Hour Productivity," Mr. Ramond said, "We have industrial relations policies that are unsound, having carried over from the war period when industrial peace was worth virtually any price."

Greatest aids in revising the policies to make them fit current conditions are, he asserted, job evaluation and job incentives.

Fair Day's Work—Touching on the increasingly important topic of how to get a fair day's work in return for a fair day's pay, Mr. Ramond pointed out the requirements are: 1. Determination of proper wage; 2. wage level at least on a par with other companies within the industry and the community; 3. coverage of all jobs by proper standards; and 4. means for encouragement of good work.

The only real test of a good method of evaluating jobs comes when it is determined whether the method works two ways, he pointed out. On only very few occasions has management been able to sell workers on accepting lower pay rates because a job is shown to be worth less, and yet this, he declared, must be done if evaluation is properly conducted.

Incentive Pay—Talking about incentive pay, Mr. Ramond explained how normals can be set which will give proper pay for good work, while paying extra for better than good performance. No greater incentive than 30 to 35 per cent should be established, he cautioned, because excess incentive may be injurious to workers' health and safety.

Another topic much in the limelight today—social welfare benefits—was touched upon by Dr. F. G. Barr, vice president, industrial relations, National Cash Register Co., Dayton, O. In explaining the philosophy of industrial relations which have kept that company free from strikes and slowdowns for several decades, Dr. Barr emphasized the company believes in teaching the art of living while making a living. Elsewhere too much emphasis, he declared, is placed today on social welfare benefits which are not enjoyed on the job.

LOADER SYSTEM: High-strength J&L steel is used to save deadweight in this loader system developed by Evans Products Co., Plymouth, Mich., for partitioning and bracing freight inside box cars. In installation shown, more than 900 pounds have been saved and one man positions the bars where two would be required if mild steel were used

Purchasers Hold Annual Meeting

CURRENT developments and prospects for the future as related to the functions of a purchasing agent will receive attention at the 34th National Association of Purchasing Agents convention and show at the Hotel Stevens, Chicago, June 20-22.

Opening session will deal with business conditions and features a report on business, markets and prices by Robert C. Swanton, chairman of the association's business survey committee, and reports from five principal purchasing areas in the U. S. and Canada. Following these reports there will be an address entitled "Management Views Trends" by William C. Johnson, executive vice president, Allis-Chalmers Mfg. Co., Milwaukee.

Charles R. Cox, president, Carnegie-Illinois Steel Corp., Pittsburgh, will

discuss the steel situation as part of the forum on steel during the afternoon session on opening day. Other features will be a forum on fuels and an address, "Purchasing's Position on the Company Management Team," by Whipple Jacobs, president, Phelps Dodge Copper Products Corp., New York.

Effects of government programs on markets and prices will also receive attention with Paul G. Hoffman, administrator, Economic Cooperation Administration, speaking on ECA and E. H. Hawkins, Munitions Board, discussing defense stockpiling. These addresses together with a nonferrous metals forum and recommendations for reorganization and proposed legislation in government procurement are all on the program for the morning session on the second day.

During the afternoon session, legal phases of purchasing, fair trade and proposed limitations on competition and a containers forum will occupy the purchasing agents' attention. The banquet that evening has as its feature the presentation of the association's J. Shipman Gold Medal.

William Simon, formerly counsel for the Capehart Committee, will speak on "Freight Absorption and Delivered Prices—Where Do We Stand?" during the morning session of the final day. A panel discussion dealing with materials management will follow.

Army Awards More Contracts

DEPARTMENT of the Army has announced the awarding of the following contracts to firms in the metalworking industries:

Trico Products Corp., Buffalo, automotive parts, $110,184; United Motors Service Division, Detroit, batteries, $103,096; Sheldon Machine Co. Inc., Chicago, lathe, engine, motor driven, $190,750; Biederman Motors Corp., Cincinnati, axles, $407,651; Diamond T Motor Car Co., Chicago, carrier, $113,269; GMC Truck & Coach Division, Pontiac, Mich., spare parts, $285,679; Federal Motor Truck Co., Detroit, engine, $256,096; Superior Burner & Furnace Co., Plymouth, Mich., tank assembly, $122,864; Fellows Gear Shaper Co., Springfield, Vt., gear, oil M6A1, $289,589; Smith & Wesson Inc., Springfield, Mass., overhaul and rebuild revolvers, $420,000; Plastic Wire & Cable, Jewett City, Conn., wire WD-1, $1,663,880; Raytheon Mfg. Co., Newton, Mass., tube, electron, $148,764; York Engineering Co., New York, reel, cable, $338,131; Utility Electronics Corp., Newark, N. J., public address set, $577,883; Buffalo Steel Co., Tonawanda, N. Y., post, barbed wire, $250,160; Bliss & Laughlin Inc., Buffalo, steel, round, $213,246; Kaiser Co. Inc., Oakland, Calif., reinforcing bars, $131,951.

L.A. Construction Gains

INDUSTRIAL construction in Los Angeles County is at a faster pace than last year, despite the general tendency to cutback plant expansion.

Acceleration in manufacturers' planning during the first four months of 1949 brought Los Angeles $30,948,000 in industrial development, including 64 new plants and expansion of 128 others. This was more than $1 million ahead of the same period last year, when there were 60 new plants and 119 expansions.

Building permits of all types issued during April were at the highest level since last August. Although the aggregate for the first four months of 1949 was slightly below a year ago, Los Angeles ranked second only to New York among the 25 leading cities. Building permit totals for the five top cities during the four-month period: New York, $192,801,360; Los Angeles, $90,113,443; Detroit, $47,987,960; Chicago, $44,415,900; and San Francisco, $39,668,084.

Steel Employment Diversified

FOUR thousand or more separate jobs are found in the steel industry, the American Iron & Steel Institute reports.

A total of 5030 separate descriptions were made for jobs selected from 30 departments. The total combined number of common and alternate titles recorded was 13,396. Some estimates indicate if a complete list of all titles used for all jobs could be compiled, the total would reach 50,000 to 60,000.

During the study, certain jobs, such as foreman, millwright, roller and time clerk, were found in many or each department. When these duplications were eliminated, the number of separate and distinct jobs was reduced to approximately 4000. Other estimates are known to have put this total in the neighborhood of 4500 to 5000 separate and distinct jobs.

Steel Technology Reflected

STEEL production, which attained a record of nearly 92,500,000 tons in the 12 months ended May 31, has been benefiting from gains in the struggle to solve raw materials problems and to improve efficiency of plants and processes, reports the American Iron & Steel Institute.

Quality of coking coals has been improved through installation of washing plants. Mechanized coal mining had increased this problem because it is less selective of coal than hand labor. Iron ore has been made more readily usable by increased beneficiation or concentration of iron content. The quality of scrap has improved and some other raw materials are in better supply. Strides have been made toward removing excess sulphur and silicon from molten pig iron.

Output has been increased sharply through use of larger furnaces, new and faster rolling mills, and improved facilities for charging furnaces. The wider use of instruments affords better control over processes.

CALENDAR
OF MEETINGS

June 20-22, National Association of Purchasing Agents: 34th convention and show, Hotel Stevens, Chicago. Association headquarters are at 11 Park Place, New York.

June 20-23, American Society of Agricultural Engineers: Annual meeting, East Lansing, Mich. Society address is Box 229, St. Joseph, Mich.

June 20-24, American Standards Association: Seminar on standardization at association headquarters, 29 W. 39th St., New York.

June 20-24, American Society for Engineering Education: Annual meeting, Rensselaer Polytechnic Institute, Troy, N. Y.

June 24, Porcelain Enamel Institute: Third annual sales management conference, Carter Hotel, Cleveland.

June 27-28, American Foundrymen's Society: Chapter chairmen's conference, Chicago. Society headquarters are at 222 W. Adams St., Chicago.

June 27-30, American Electroplaters' Society: National convention, Hotel Schroeder, Milwaukee. Society headquarters are at 473 York Rd., Jenkintown, Pa.

June 27-July 1, American Society of Mechanical Engineers: Semiannual meeting, University of California Extension Bldg., San Francisco. Society headquarters are at 29 W. 39th St., New York.

June 27-July 1, American Society for Testing Materials: 52nd annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

July 11-16, Concrete Reinforcing Steel Institute: 25th anniversary meeting, The Greenbrier, White Sulphur Springs, W. Va. Wire Reinforcement Institute will meet July 11; Steel Joist Institute will meet July 12; American Iron & Steel Institute Committee on Reinforced Concrete Research will meet July 13; Rail Steel Bar Association will meet July 13; Concrete Reinforcing Steel Institute will meet July 14-16. Last group's headquarters are at 38 S. Dearborn St., Chicago.

July 13-15, American Society of Civil Engineers: Summer convention, Mexico City. Society headquarters are at 33 W. 39th St., New York.

July 14-15, Magnesium Association: Quarterly meeting, Hotel General Brock, Niagara Falls, Canada. Association headquarters are at 30 Rockefeller Plaza, New York.

July 22, Truck-Trailer Manufacturers Association: Mid-year general meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 809 National Press Bldg., Washington.

July 28-29, American Foundrymen's Society: Annual directors' meeting, Chicago.

Aug. 10-12, Western Packaging Exposition, Civic Auditorium, San Francisco.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Statler Hotel, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 15-16, Magnesium Association: Quarterly meeting, Hotel Statler, Detroit. Association headquarters are at 30 Rockefeller Plaza, New York.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibits committee.

Sept. 29, American Iron & Steel Institute: Regional Technical meeting, Hotel Statler, Buffalo.

A RUGGED MACHINE FOR

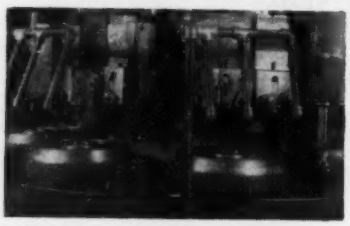
THOSE RUGGED JOBS — *But Fast*

BULLARD

TYPE "D" 16-23

MULT-AU-MATIC

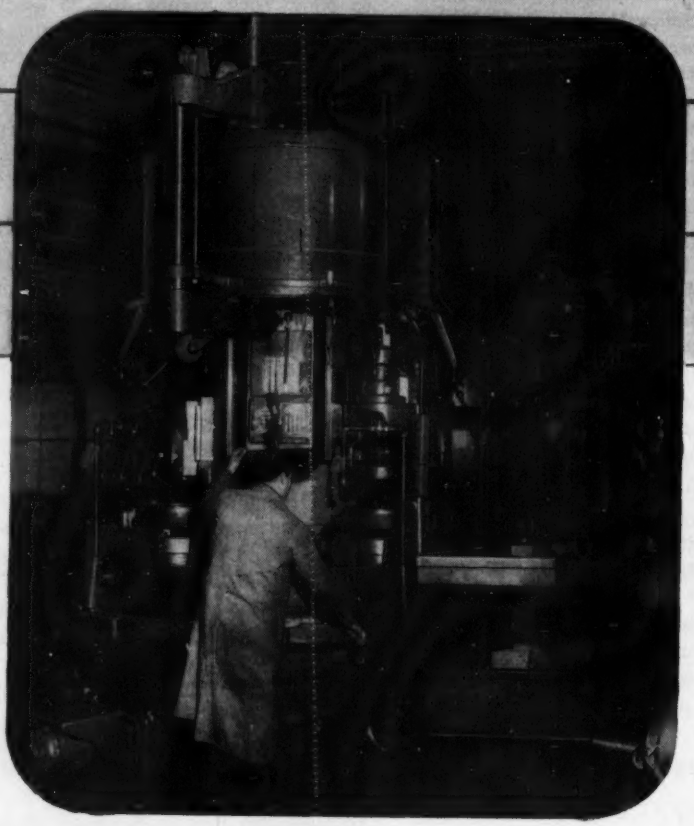
Sta. 1 — Load. Sta. 2 — Rough bore hole, rough turn and sweep chamfer.



Sta. 3 & 4 — Three, rough face and four, second face.

Sta. 5 & 6. Five, finish face and six, true bore, ream, ct' bore, turn and chamfer.

Sta. 7 & 8. Multiple drilling.



BULLARD

Machining Flywheels to close accuracy at a Profit-Making Pace. Rugged work — BUT FAST.

Mult-Au-Matic's rugged construction assures rigidity under heavy cutting. Repetitive accuracy throughout long runs minimizes spoilage and inspection costs.

Mult-Au-Matic design provides for a wide variety of tooling to meet the requirements of a wide variety of work design.

Ask for a Bullard Cost Saving survey of your jobs when applied to the Mult-Au-Matic. Write today.

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Doleful view of business outlook in financial circles contrasts strikingly with humming activity in automotive plants. Pressure for more car production seen everywhere

DETROIT

REPEATED sinking spells of the stock market and the doleful expressions on the business outlook emanating from eastern financial circles contrast strangely with the humming activity in plants of the automobile industry. Pressure for more production is everywhere. Second shifts are being added to assembly lines, with some difficulty being experienced in obtaining a sufficient supply of experienced help. Many 8-hour shifts have been extended to 9 hours, although in one case union objections forced a cutback to 8½ hours. Saturday operations were in force in a number of the General Motors Divisions during May, but were suspended this month. Chevrolet in particular is pushing the assembly pace and needling suppliers to step up shipments.

Packard has increased daily assemblies from 580 to 640, peak single-shift capacity. Demand from the field is reported to be unusually strong, following the dispatch of several thousand gold-painted sedans to all sections of the country, commemorating the start of golden anniversary models. Of course, Packard lost several thousand cars during May because of the tieup of brake shipments from Bendix. This hurdle has been cleared by setting up brake assembly operations in Detroit, removing necessary dies from the Bendix plants in South Bend, Ind., and instructing former suppliers to route shipments to Detroit and to Wagner Electric Corp., which is co-operating on the problem.

Reach Postwar Peak—Chrysler Divisions have reached a postwar peak in production and plan to move progressively higher. One of them, DeSoto, notes unprecedented dealer demand for new cars, the only possible soft spot being southern California. Its current assemblies are on the basis of about 10,000 monthly and the total for this year is calculated to reach 110,000, an all-time high. Dealers' used car stocks aggregate 18,000, low in comparison with the 57,000 units they carried in June, 1940.

Changes in West Coast assembly operations are being instituted by Chrysler to speed up distribution of cars and trucks there. The Dodge San Leandro plant will take on assembly of Plymouth cars in addition to Dodge cars and trucks. This plant was opened in April of last year. At the Los Angeles plant, which began operations in 1932, Chryslers and DeSotos have been added to production schedules. Chrysler has been assembling on the coast since 1929 when Dodge trucks were built in a plant at Stockton.

The Los Angeles plant provides 450,000 sq ft of floor space and employs about 1200, serving principally southern California, Arizona, Utah and part of Nevada. The San Leandro plant, while newer, is somewhat smaller, with 300,000 sq ft of space and employing some 800. It serves markets in Oregon, Washington, Idaho, northern California, Alaska and part of Nevada. Thus it is seen Chrysler has moved further toward decentralizing assembly operations, doubtless realizing this is the only way to overcome the freight disadvantage to which it is subject, compared with General Motors and Ford.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	505,000*	359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
May 28	117,703	92,772
June 4	98,087	75,607
June 11	134,714	109,831
June 18	142,000	109,259

Estimates by Ward's Automotive Reports

Sets Record—General Motors set a new all-time high record in May, building 265,280 cars and trucks topping the old record of April, 1941, by 2650 units. This achievement represented 51.8 per cent of the entire industry's output, an abnormally high percentage because Ford was shut down a good part of the month. GM is expected to better the May showing this month and the only official indication that a tapering off is in prospect was the statement by board chairman, Alfred P. Sloan Jr., to the effect the entire industry would experience slackening production in the latter part of the year.

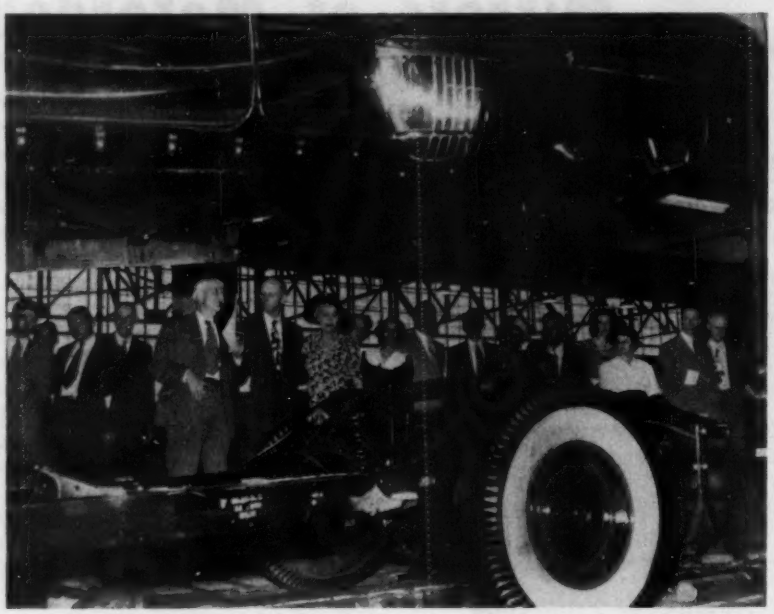
Independent manufacturers are enjoying the same booming market. The picture at Studebaker is particularly bright, the company setting an all-time monthly record in May by building 26,500 vehicles in the United States and Canada. Output holds to full throttle at around 5100 passenger cars and 1500 trucks each week. Distinctive new body styling for the smaller Champion model later in the year, along with the introduction of a torque-converter automatic transmission on the Commander series, should be effective stimulants to sales if they should droop this fall.

Kaiser Doing Better—Kaiser-Frazer, while considerably off the pace of a year ago, has progressively improved its schedules since closing the Willow Run plant early this year for inventory and retooling. Introduction of two utility models and a substantial slice off prices have helped, and assemblies within the past few weeks have been inched up to 600 per day, about half of them the Traveler and Vagabond utility jobs. The Frazer is practically out of production, only 50-100 a week being turned out. Two reasons are suggested, one is that the price is too high, the other that the name Frazer seems to have gone into eclipse at Willow Run. Nearly all the top personnel brought in originally by Joseph W. Frazer have left, to be replaced by Kaiser associates. Several of the high-ranking sales officials have switched over to Crosley and are undertaking expansion and revitalization of the distribution setup for the midget car builder.

Crosley Goes To Cast Iron

CROSLEY has abandoned its original type of engine which was built up

(Material in this department is protected by copyright and its use in any form without permission is prohibited)



BODY DROP: One of the most dramatic moments in auto manufacture, the body drop, is watched by a group of General Motors stockholders during a tour of the Wilmington, Del., assembly plant

of brazed steel stampings, in favor of a cast iron block. Noise was the principal reason, it is believed, since cast iron has pre-eminent qualities for use in motor blocks because of its damping characteristics.

A second recent change is the adoption of airplane-type hydraulic disk brakes. Each wheel has a flat cast iron disk bolted in place, with two diametrically opposed friction pads bearing against the disk when hydraulic pressure is applied through the brake pedal. The pads are faced with brake lining material and are claimed to keep the disks wiped free of grime, accumulation of which is further minimized by the centrifugal action of the whirling disk.

Through June 4, Crosley had assembled something over 5000 units this year, about 40 per cent below the same period last year. Currently, schedules call for 100 a day, although full weeks have not been worked regularly.

No Gloom in Sight

SO, as far as production is concerned, for the first half of the year, there are no gloomy aspects in the motor industry, and no one yet is forecasting any sharp slips for the next six months. Admitting that the six wise men of the East base their present thinking on what they believe the situation will be 6-9 months in the future, there is little reason for being bearish on automobiles. All common stocks in the industry are far underpriced in relation to earnings or dividends.

If the forecasters are discounting automobile manufacture and concentrating their worry on other fields of industry, they may be forgetting that at least twice in the past 20 years it has been the automotive industry which pulled the United States economic system up out of the mud. It could happen again, if such need there be. After all, there are 13 million cars on the road over 10 years old, individual savings are at a high level, at least according to most surveys, and an automobile is usually No. 1 on a buyer's list after food, clothing and shelter.

Steel Rate Being Watched

THE gradually declining steel operating rate is a trend which many observers are watching closely. If it should drop to, say, 70 per cent of capacity by September as some are predicting, then look for a swarm of steel salesmen to descend on Detroit and start talking "deals" with automotive buyers. This occurred in 1938, it will be recalled, and purchasing agents rub their hands gleefully when they recall those days. Cold-rolled sheets at $11 under the quoted market and no questions asked — will the memory linger on?

Passage of the O'Mahoney bill permitting freight absorption within certain limits would appear to pave the way for more steel suppliers to come into the Detroit market, from which some have departed, either willingly or otherwise, since the incidence of mill pricing. There may be some real hectic times ahead for steel in the Detroit area.

What's Normal in Auto Picture?

IN TRYING to assess the automotive picture to determine what might be considered "normal" you run into a mass of conflicting opinion. Certainly the current rate of six million cars and trucks a year is well beyond normal, considering statistics of the past 10-20 years, and even taking into consideration such factors as population growth, increased national income and purchasing power. Suppose a figure of 4.5 million units annually is taken as normal, then operations now are 33 per cent above normal, and even a 20 per cent drop should be nothing to give serious concern.

The trouble is that too many people have come to regard the furious years of 1947 and 1948 as normal, forgetting they were abnormally inflated by backed-up postwar demand. The moment there is any slippage from the indexes of these two years, then the country is supposed to be headed for trouble. A more realistic view would be that there is still some downhill distance to travel before conditions even have returned to a normal plane.

Military Orders in Prospect

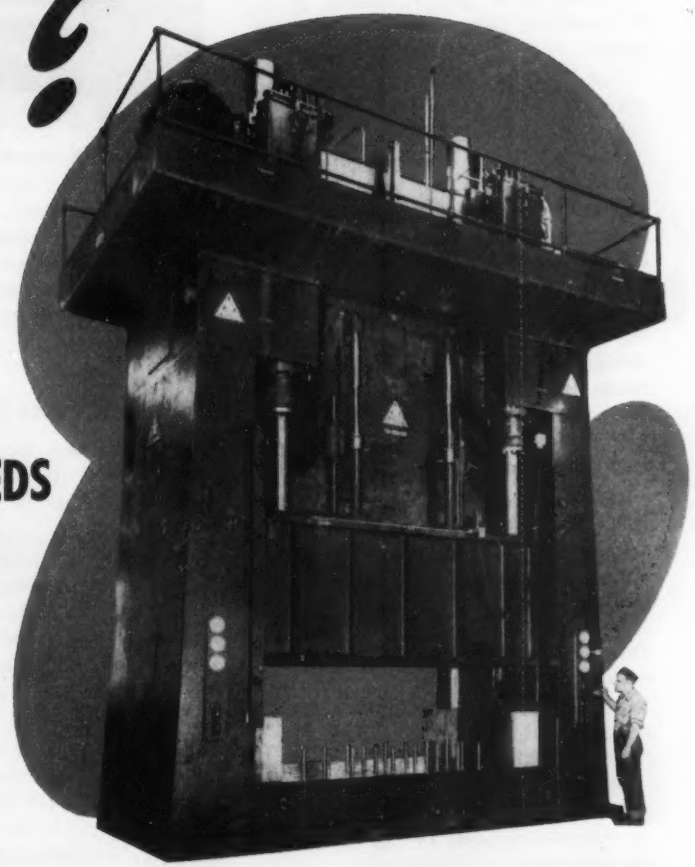
SUBSTANTIAL military orders for motor vehicles, aggregating perhaps as much as $125 million, are in sight as soon as the necessary appropriation bills are passed by the Senate in Washington. Funds will be provided for an estimated 17,500 units, plus a vast array of spare parts (the military services often specify 70-80 per cent of the value of a vehicle in additional equipment, gadgets and spare parts for a year.) Likely recipients will be Chevrolet, Ford, Dodge and Willys-Overland.

The vehicles themselves will cost around $83 million and the parts another $42.5 million, better than twice what was spent for this account in the past fiscal year.

Tucker Indictment No Surprise

INDICTMENT of Preston T. Tucker, president of Tucker Corp., Chicago, and seven associates on charges of fraud and conspiracy in connection with their $26 million auto manufacturing venture was not entirely unexpected in view of earlier revelations in bankruptcy and receivership suits. The defendants appeared in a Chicago court last week and posted bonds.

How's this capacity?



PRESS CAPACITIES UP TO
2500 TONS
72" x 150" BEDS
66" STROKES

LET US SOLVE YOUR PROBLEMS IN PART ENGINEERING, DIE DESIGNING, AND THE PRODUCTION OF YOUR...

METAL STAMPINGS

Our engineering capacity to assist in the development of parts will help you considerably in reducing costs. Housed in our great modern plant are the following necessary facilities, such as—

1. COMPLETE PRODUCTION MACHINE SHOP
2. ALL METHODS OF HEAT TREATING
3. METAL CLEANING AND BRAZING
4. WELDING OF ALL TYPES
5. TESTING & INSPECTION

Our capacity for service is limited only by the opportunities you afford us. May we add your firm to our steadily growing list of clients?

THE LEAKE STAMPING COMPANY

Engineers • Consultants • Manufacturers

1250 EAST FIRST STREET
MONROE, MICHIGAN

Sales Levels Hold

As ATF Inc. continues its program of more product diversification and sales coverage

PROGRAM of more product diversification and greater sales coverage is helping ATF Inc., Elizabeth, N. J., to maintain sales levels at postwar peaks.

Net sales for the fiscal year ended Mar. 31 were $37,842,000, up $971,000 from the year before and establishing a record for peacetime operations. During the year ATF entered the gravure printing field with purchase of Klingrose Machine Corp., Brooklyn, N. Y., and now makes a gravure press as well as equipment for the manufacture of gravure printing cylinders. Supplementary dollar revenues, otherwise not available because of world-wide currency restrictions, will also be received through a program of licensing the manufacture of ATF printing products abroad.

Domestic sales coverage for the ATF line of tubular steel furniture was broadened with the purchase of a company in Fullerton, Calif., now operating as Balboa Pacific Corp. Another subsidiary, Daystrom Corp., Olean and Friendship, N. Y., also makes tubular furniture. This unit has expanded production, enlarged its regional sales force and warehouse organization.

Frederick Hart & Co. Inc., ATF subsidiary in the field of electronics, at Poughkeepsie, N. Y., is expanding its activities.

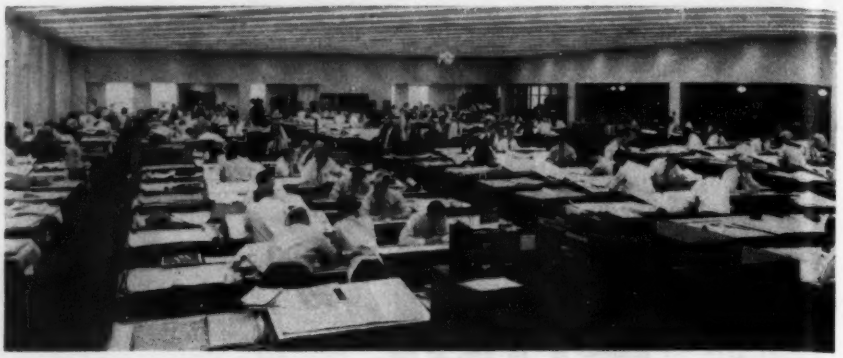
Net earnings after taxes for fiscal 1948 were $2,170,000, second only to the company's all-time high in 1947 when it earned $2,615,000.

McCarthy Drops Tube Firm

SEEN as the latest example of steel consumers divesting themselves of steel producing facilities is the withdrawal of Glenn McCarthy, Houston, Tex., oil man, from McCarthy International Tube Corp., Detroit, of which he had been president and part owner. The company was formed last December (STEEL, Dec. 20 issue, p. 70) upon acquisition of the facility from Detroit Tube & Steel Co., Sharon Steel Corp. subsidiary.

New officers of the concern, now named International Tube Corp., are Barney E. Hokin, president, Edward M. Ray, vice president, and Edwin Hokin, vice president and treasurer. All are connected with International Rolling Mill Products Corp., Chicago.

Producing seamless tubing in a size range of ⅛ to 5½ inches, the facility has recently been modernized with addition of three new automatic cold-working benches and normalizing and bright annealing furnaces.



Drafting room on third floor of United Engineering's new office building

Lukens Repairs Large Mill

LUKENS Steel Co., Coatesville, Pa., shut down its 120-inch, four-high plate mill June 19 for repairs.

These involve rewinding a motor, reconditioning shears, a new housing and general overhauling. The shutdown will probably last about two weeks and will also include the 112-inch mill which serves as a breakdown unit for the 120-inch facility.

Employees who are affected by this shutdown and are to be retained in employment when the operations of the mill are resumed, but for whom there will be no work available during the period, will be scheduled to take any vacation to which they would have been entitled.

The 120-inch mill was built by the U. S. Navy and placed in operation in 1943, with a 2000-foot continuous plate-production line.

Iron Ore Properties Acquired

JONES & Laughlin Steel Corp.'s subsidiary, Jalore Mining Co. Ltd., has exercised an option entered into Jan. 1, 1947, for a 50-year lease on 1400 acres of iron ore property known as the Ruth and Lucy mines, north of Michipicoten Harbor on Lake Superior in the Algoma district of Ontario province. Company believes these ore bodies will yield close to 30 million tons. The ore is 20 per cent by weight of ferrous carbonate oxide, averaging about 35 per cent iron content, also 3.5 per cent sulphur.

The iron ore is underground but not at great depth. Sintering of the ore will be required in the neighborhood of its origin, even if the product is to be moved to J & L blast furnace properties by water. It will probably be necessary for J & L to build a sintering plant.

United Moves to New Offices

UNITED Engineering & Foundry Co. has moved into its new general office building at 948 Duquesne Way, Pittsburgh. The $2 million structure is one of the first to be completed under Pittsburgh's new building code.

Each of the three floors contains 16,300 sq ft of office space, and will house between 500 and 600 executives and employees of the company. Front of the building is limestone and granite and two sides are of face brick, colored to correspond to the stone front.

Main offices have movable steel partitions, so that space may always be divided to meet requirements.

British Cranes To Be Sold in U.S.

THROUGH a nation-wide dealer organization, Coles Cranes Inc., the American distributor at 4319 South Paulina St., Chicago 9, is introducing to the U. S. market a line of mobile cranes, the product of Steel Engineering Products Ltd., Sunderland, England. Thus far 16 dealerships in the United States and six in Canada have been established, each completely stocked with spare parts to render immediate service on the equipment.

A number of unique features, outstanding of which is the cantilever boom crane's ability to pick up and deposit loads as close to its side as one and a half feet, distinguish the Coles line.

The American company along with its Canadian counterpart, Steel Engineering Products Ltd. of Canada, Leeside, Toronto, are subsidiaries of the English organization. President of Coles and of the Canadian firm is George M. Bassnett, whose headquarters are in Chicago.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Selas Corp. of America, Philadelphia, will take over the industrial dehumidification equipment activities of the equipment section, Engineering Division, Davison Chemical Corp., Baltimore, effective July 1.

—o—

Binks Mfg. Co., Chicago, manufacturer of spray painting equipment, has compiled a record of 1 million man-hours of work time without a disabling injury.

—o—

American Machine & Foundry Co., New York, has placed on the market a machine that combines automatically and in a single compact unit the processes of stemming and separating the tobacco leaf. The device handles from 1000 to 1800 pounds of leaf tobacco per hour.

—o—

Edward Parkinson Mfg. Co. Inc., producer of wire goods, hooks and chains, has moved from Providence to a new, enlarged plant at Maple and Oak Sts., Esmond, R. I.

—o—

National Supply Co., Pittsburgh, has formed a subsidiary, National Supply Co. of Venezuela C. A., Caracas, which will represent Venezuelan interests of the company as well as those of its British associate, Oil Well Engineering Co. Ltd.

—o—

War Assets Administration has approved sale of the government-owned facilities of Ohio Steel Foundry Co., Lima, O., to that company for $1,050,000. Ohio Steel Foundry had been operating the facilities under lease since 1946.

—o—

Technical Metal Processing Inc., engaged in commercial metal joining and induction heat treating work, has moved into new and larger quarters at E. 55th St. and Lake Court, Cleveland.

—o—

Leeds & Northrup Co., Philadelphia, manufacturer of electrical measuring instruments, automatic controls and heat treating furnaces, is observing its 50th anniversary.

—o—

Ward Steel Co., Boston, distributor of spring steel, has completed construction of a warehouse at 3042-58 W. 51st St., Chicago.

—o—

Carborundum Co., Niagara Falls, N. Y., has completed its new service, research and production facilities at Wheatfield, N. Y., and has published a 32-page book presenting the outstanding features of the plant.

—o—

Ingalls Shipbuilding Corp., Birmingham, has completed at its Decatur, Ala., shipyard a new type barge for Marquette Cement Mfg. Co., Chicago. Principal feature of the craft is a bow of raked end design which permits it to be towed at speeds of 12 miles per hour and higher.

—o—

Air Reduction Sales Co., New York, manufacturer of industrial gases and welding equipment, has opened an acetylene plant in Acton, Mass. This facility has a rated capacity of 100,000 cu ft per day. A. L. Beck is superintendent.

BONUS PAYS OFF

FATE-ROOT-HEATH Co., Plymouth, O., manufacturer of small industrial locomotives, farm tractors and clay-working machinery, has paid $334,032 in bonuses to some 400 employees in the last seven years. The company has never had a strike in its 59-year history.

The bonus amounted to $29,124 in 1941 when the plan was started and has grown until $59,059 was distributed last Christmas. The firm also has a policy of loaning its equipment to employees without charge.

Company president is John A. Root.

Republic Steel Corp., Cleveland, reports its Trumbull Cliffs blast furnace in the Youngstown area produced 46,003 tons of iron in May, a new record.

—o—

American Platinum Works, Newark N. J., has appointed Steel Sales Corp., Chicago, as distributor of silver brazing alloys and fluxes in Illinois, Michigan, Indiana, Missouri, Wisconsin, Minnesota, Iowa, North and South Dakota, Nebraska and Kansas.

—o—

Olin Industries Inc., East Alton, Ill., has acquired certain assets of two plants for manufacture of railway fusees and torpedoes, located in Peru, Ind., and Los Gatos, Calif. Parent organization of the two plants was Noma Electric Corp., New York. Central Railway Signal Co. Inc., Peru, and Pacific Railway Signal Co., Los Gatos, become affiliated with Olin.

—o—

Tinnerman Products Inc., Cleveland, manufacturer of fasteners, has moved its Detroit district office to larger quarters at 14550 Third Ave. Ray Templeman is manager.

—o—

Tube Turns Inc., Louisville, Ky., manufacturer of welding fittings and flanges, has moved its Los Angeles branch office to 612 S. Flower St. Norton P. Bosemer is manager.

—o—

General Motors Corp.'s Train of Tomorrow, climaxing two years of national exhibition, moves onto Chicago's midtown lake front June 25 as a part of the 100-day Chicago Railroad Fair. About 5 million have already inspected the train.

—o—

Independent Pneumatic Tool Co., Aurora, Ill., manufacturer of portable power tools, has constructed new factory branch sales and service buildings in Chicago, New York, Pittsburgh and Toronto, Canada. The four new buildings replace previous office sites in the same cities.

—o—

Bridgeport Brass Co., Bridgeport, Conn., has opened a new sales office in the Dwight Bldg., Kansas City, Mo., to handle mill products, plumbing brass goods, copper water tubing and pipe and other Bridgeport lines.

—o—

B. C. Ames Co., Waltham, Mass., manufacturer of micrometer dial indicators and micrometer dial gages, has appointed G. C. Wood Co., Pittsburgh, as distributor in the tri-state area.

—o—

Watch-Motor Mainspring Co. Inc., New York, has changed its name to Sandsteel Spring Co. Inc. "Sandsteel" is the trade name for its major watch product, a mainspring. The company is also entering the industrial-spring field.

—o—

Merrill Bros., Maspeth, N. Y., manufacturers of drop forgings and materials lifting devices, has named the following sales agents for the territories indicated: George A. Allen Co., Chicago, for Illinois, Missouri and Kansas; C. B. Lawrence Co., Cleveland, for Ohio, Michigan and Indiana; Henry R. Hansen, Denver, for Colorado, Wyoming, Utah and New Mexico; Val W. Ove Metal Products Co., Milwaukee, for Wisconsin, Michigan peninsula, Minnesota, Iowa and Omaha, Nebr.

The Business Trend

SIZABLE increase in automobile assemblies was partly nullified by a drop in the steelworks' operations rate in the week ended June 11 with the result that STEEL's industrial production index for the period, at a preliminary 168 per cent of the 1936-1939 average, matched the one for the corresponding week last year. Although the index is at the same level for the two years, the big difference is that last year the index continued to climb during the year while this year predictions of future industrial activity are gloomy, at least for the near-term.

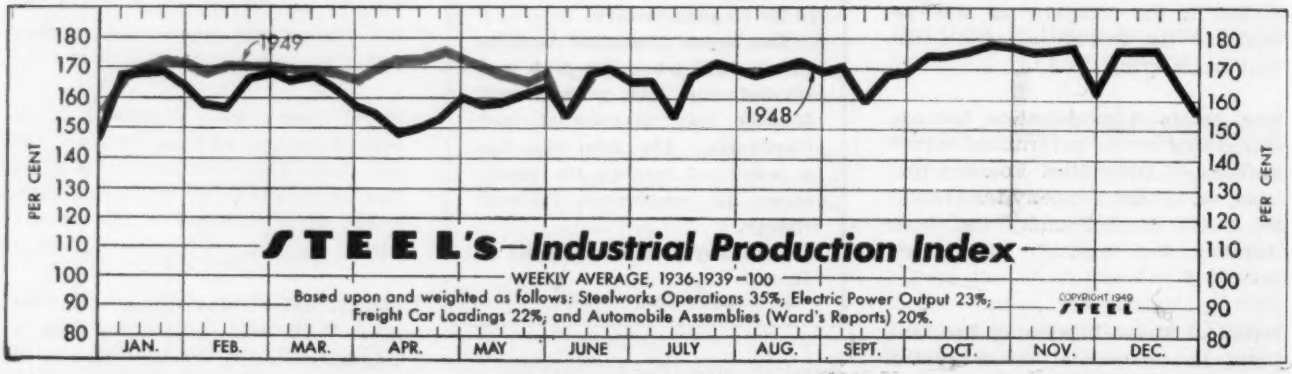
STEEL—Steelworks operations, which were a pacesetter for all of industry during the first quarter of 1949, have declined steadily from week to week since the all-time high was reached during the week ended Mar. 19. In the week ended June 11, the steel ingot rate dipped to 87.5 per cent of capacity, the lowest rate since the week ended May 1, 1948. Despite the relatively sharp decline from the lofty level of operations in the early part of this year, it must be remembered that operations from 1936-1939, base years for STEEL's index, were 60.6 per cent of a considerably smaller capacity.

AUTOMOBILES—Although cutbacks in other industries are announced almost daily, the automobile builders continue to produce at a pace in excess of 1929 which was the record year for the industry. The week ended June 11 saw an outturn of 134,714 passenger cars and trucks, an increase of more than 36,000 units from the preceding week. This total was attained despite the fact that Ford's operations were still below the pre-strike levels. With continued availability of raw materials and the absence of further labor difficulty, the industry expects to continue its high assembly rate for some time.

COAL—Whether or not the automobile builders have their raw materials depends on the supply of coal to a large degree. Although stockpiles are up to some 65 million tons, a shortage of fuel on the part of critical suppliers could put a crimp in production plans. Only small amounts of coal will be mined in the next four weeks but it is reported that steel mills have adequate stocks and that Detroit Edison Co., which supplies power for the bulk of automobile builders, has more than three months' supply.

TRUCKLOADING—For a number of months the volume of freight transported by motor carriers had topped the total for the corresponding month in the preceding year. In April, however, this trend was halted as the aggregate for the month was below both a year ago and the preceding month totals. American Trucking Associations reports that the April total was 3,159,297 tons as against 3,344,052 tons in March and 3,255,798 tons in April, 1948.

INVENTORIES—Business inventories at the end of April totaled about $53.6 billion, down $1.2 billion from a month earlier but 5 per cent higher than for the same date a year ago, according to the Department of Commerce.



Index (chart above): Week ended June 11 (preliminary) 168 Previous Week 155 Month Ago 168 Year Ago 168

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	87.5	92.0	95.5	96.0
Electric Power Distributed (million kilowatt hours)	5,300	5,081	5,257	5,132
Bituminous Coal Production (daily av.—1000 tons)	1,677	1,886	1,868	2,164
Petroleum Production (daily av.—1000 bbl)	4,876	4,897	4,899	5,479
Construction Volume (ENR—Unit $1,000,000)	$226.2	$123.1	$131.0	$174.1
Automobile and Truck Output (Ward's—number units)	134,714	98,087	119,634	109,831

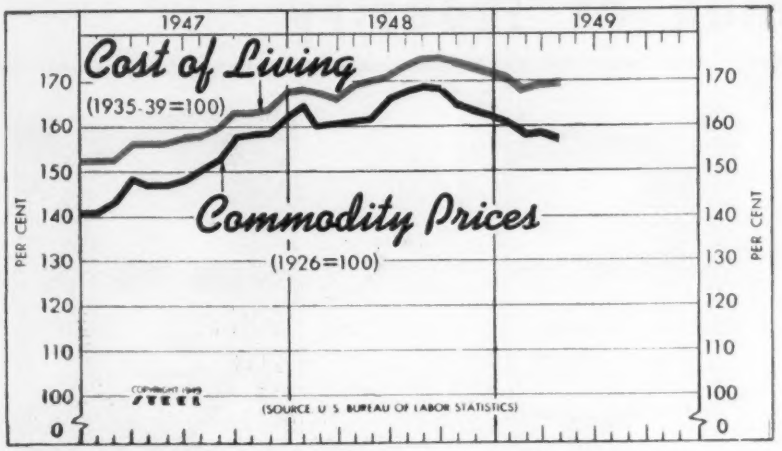
* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

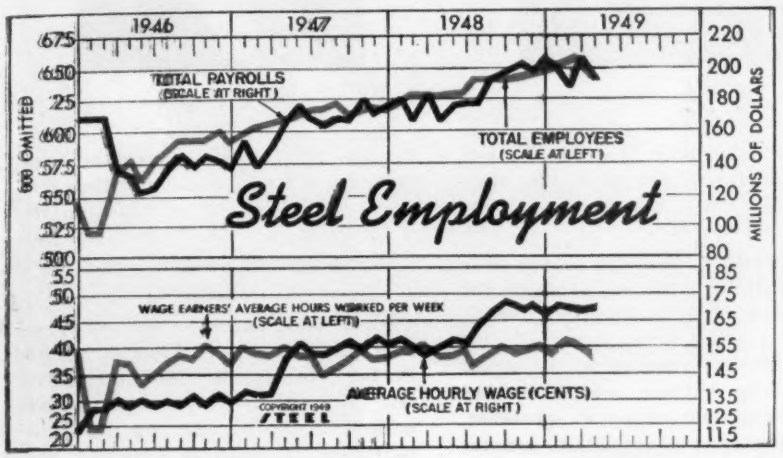
TRADE				
Freight Carloadings (unit—1000 cars)	765†	699	772	907
Business Failures (Dun & Bradstreet, number)	174	165	171	110
Money in Circulation (in millions of dollars)‡	$27,484	$27,515	$27,452	$27,864
Department Store Sales (changes from like wk. a yr. ago)‡	−8%	−7%	+2%	−4%

† Preliminary. ‡ Federal Reserve Board.

Wholesale Commodity Price—Cost of Living Indexes

	—Commodities— (1926=100)			—Living Cost— (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.6	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	169.3	156.2
May	....	163.9	147.1	....	170.5	156.0
June	....	166.2	148.0	....	171.7	157.1
July	....	168.7	150.8	....	173.7	158.4
Aug.	....	169.5	153.7	....	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2





Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1949	1948	1949	1948	1949	1948
Jan.	650	622	$202.1	$180.2	171.3	157.3
Feb.	653	626	189.8	167.6	169.6	155.1
Mar.	652	629	207.2	183.0	168.5	154.8
Apr.	647	626	191.9	168.5	168.8	155.1
May	....	628	....	175.3	....	157.7
June	....	634	....	179.5	....	156.9
July	....	641	....	179.8	....	164.5
Aug.	....	645	....	193.8	....	168.9
Sept.	....	641	....	199.4	....	171.8
Oct.	....	644	....	201.7	....	169.9
Nov.	....	646	....	199.8	....	172.1
Dec.	....	648	....	205.8	....	169.4

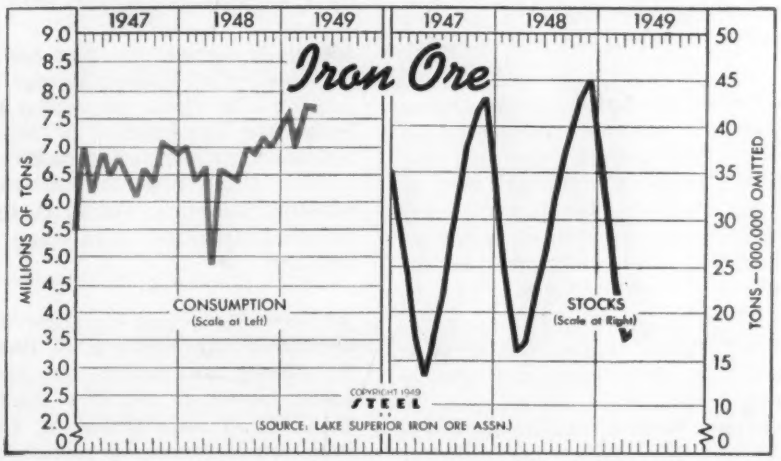
† Monthly average.

Iron Ore

(Lake Superior Iron Ore Assn.)

Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	....	6,656	.....	22,058
June	....	6,577	.....	26,965
July	....	6,479	.....	32,611
Aug.	....	7,036	.....	37,081
Sept.	....	6,965	.....	40,923
Oct.	....	7,273	.....	43,883
Nov.	....	7,058	.....	45,160
Dec.	....	7,351	.....	39,460
Total	....	80,504		



FINANCE	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,180	$10,287	$12,273	$13,071
Federal Gross Debt (billions)	$251.6	$251.7	$251.6	$251.8
Bond Volume, NYSE (millions)	$16.1	$13.3	$15.0	$27.7
Stocks Sales, NYSE (thousands)	4,605	3,742	4,052	7,542
Loans and Investments (billions)†	$62.3	$62.3	$61.6	$62.9
United States Gov't. Obligations Held (millions)†	$34,035	$34,145	$33,263	$35,218

† Member banks, Federal Reserve System.

PRICES				
STEEL's Composite Finished Steel Price Average	$92.09	$92.77	$93.55	$80.27
STEEL's Nonferrous Metal Composite‡	169.6	173.7	184.4	200.9
All Commodities†	156.1	156.1	155.9	165.2
Metals and Metal Products†	167.2	167.3	168.1	158.1

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

R. G. CAULLEY

R. C. FRIEDLY

CARL L. HUFF

R. G. Caulley has been appointed general sales manager of Peninsular Grinding Wheel Co., Detroit. Formerly assistant sales manager for Republic Steel Corp., Cleveland, and director of purchases at Fruehauf Trailer Co., Detroit, Mr. Caulley operated his own wholesale steel warehouse in Florida before joining Peninsular. **Dr. W. R. Morgan,** formerly research professor of ceramic engineering at the University of Illinois, has been appointed director of production and engineering of the new vitrified division plant of Peninsular.

—o—

J. Tedford Bachman, former Sharon Steel Corp. executive, has been named general manager of sales for Cold Metal Products Co., Youngstown, effective July 1. He formerly was assistant vice president of operations of Sharon Steel, and was with the company for many years.

—o—

John F. Ducey Jr. and **Sam R. Watkins** have been appointed district sales managers of Brake Shoe & Castings Division, American Brake Shoe Co., New York. Mr. Ducey is located in the New York office, and Mr. Watkins in the Cleveland sales office.

—o—

Charles Pingry has been appointed district sales engineer to the Dallas office of Chain Belt Co., Milwaukee.

—o—

Robert S. Fleshiem has been promoted from manager of the electrical department, Allis-Chalmers Mfg. Co., Milwaukee, to assistant to the executive vice president, General Machinery Division. In his new post he succeeds **J. D. Greensward,** recently named general manager, Norwood, O., Works. **Roy M. Casper** succeeds Mr. Fleshiem in the electrical department.

—o—

R. C. Friedly has been appointed central states regional manager for the Nelson Stud Welding Division of Morton-Gregory Corp., Lorain, O. He joined Morton-Gregory when he returned from military service in 1946 as construction industry specialist, and has served as assistant general sales manager since May, 1948.

—o—

Harley A. Gardner has been appointed treasurer of Willard Storage Battery Co., Cleveland, succeeding **I. K. Schnaitter,** who resigned as treasurer and assistant secretary because of ill health. **C. H. Bell** has been named assistant secretary, and **J. C. Crum,** assistant treasurer succeeding Mr. Gardner.

—o—

Air Reduction Sales Co., New York, announces appointment of **Richard N. Chapin** as general purchasing agent, located in the New York office. He succeeds **Walter R. Clark,** who resigned from Air Reduction to join U. S. Industrial Chemicals Inc. as head of its purchasing department.

—o—

Fred V. Hart has been appointed industrial representative of Paulsen-Webber Cordage Corp., New York. He has been a member of the sales department of Plymouth Cordage Co., and in his new position will be responsible for expanding Paulsen-Webber's sales and service to include industrial users of wire rope, fiber rope, canvas and chain.

—o—

International Business Machines Corp., New York, has appointed **Thomas H. Connell** as assistant sales manager of its International Time Recording Division, with headquarters in New York. He previously was ITR manager at Detroit.

—o—

Carl L. Huff has been elected president and director of Bliss & Laughlin Inc., Harvey, Ill. He succeeds the late **Walter R. Howell.** Mr. Huff became affiliated with the sales department of Bliss & Laughlin Inc. in 1923. In 1929 he was advanced to western sales manager and in 1936 was elected vice president in charge of sales. Also elected to new offices are: **George A. Spaulding,** formerly vice president, elected vice president in charge of eastern operations; **Harry W. Lillengren,** formerly secretary-treasurer, elected vice president and treasurer; and **Eldon F. Thomason,** formerly assistant secretary, elected secretary.

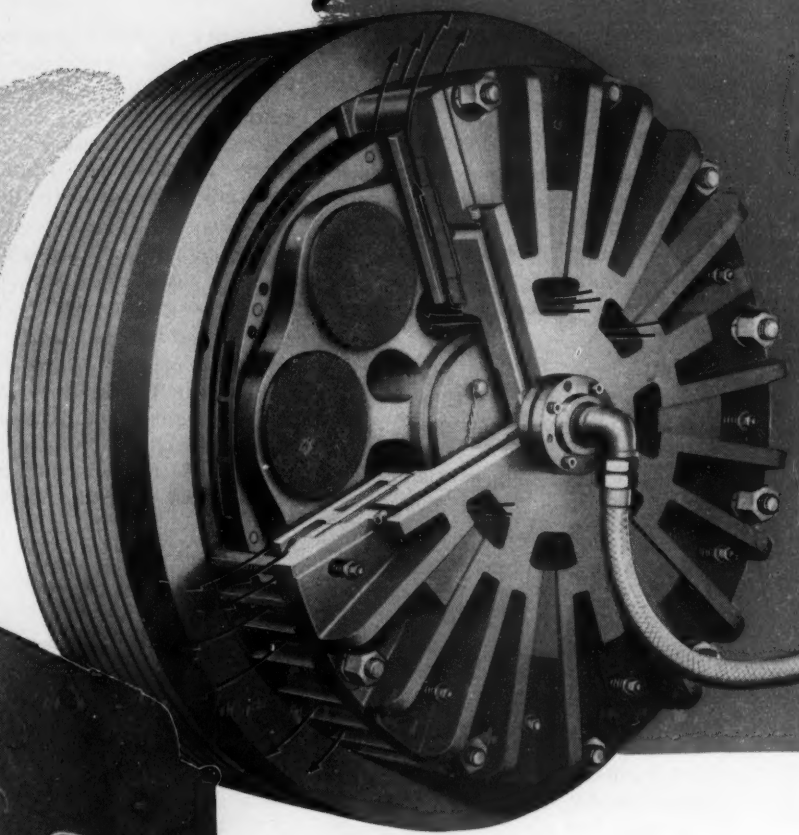
—o—

J. O. Cornette, controller for Pacific Airmotive Corp., Burbank, Calif., for the past year and a half, has been appointed treasurer and controller. He formerly was division controller for Consolidated Vultee Aircraft Corp. **O. P. Graff** has been appointed secretary of Pacific Airmotive Corp. after nearly a year in the sales division, and more recently as service sales manager. Before joining the company he was manager of the engineering department of Lockheed Aircraft Service.

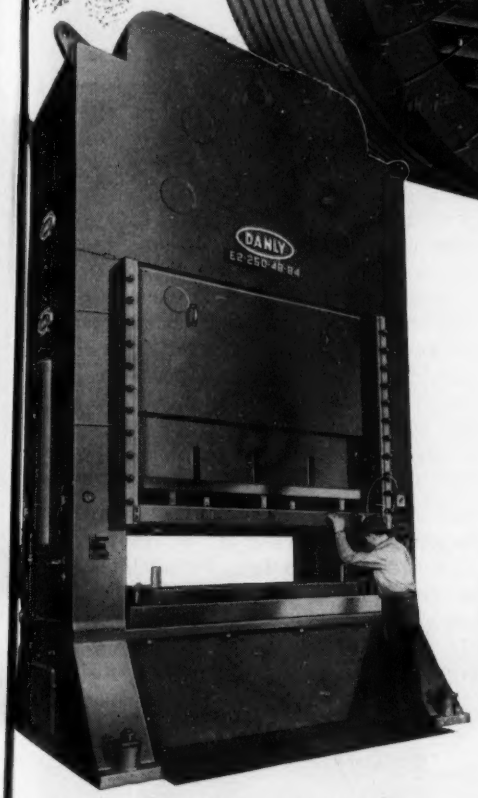
—o—

American Management Association, New York, announces the following election and new appointments to offices and committee posts for the coming year: Chairman of the executive committee, **Don G. Mitchell,**

A Big Reason Why



DOWN-TIME *is* REDUCED *with* DANLY PRESSES



New Exclusive Clutch Design Increases Production Efficiency

The complete line of Danly Mechanical Presses are engineered to reduce down-time and insure longer, uninterrupted operations. A new and entirely different type of friction clutch is used which eliminates the most common cause of clutch failures—excessive heat generation. This cool operation contributes to the long life of the friction disc and all non-metallic elements of the clutch.

Low Starting Torque Reduces Heat and Wear

Most of the components in the new Danly Press Clutch rotate continuously with the flywheel. With fewer elements subject to acceleration, starting torque and heat are substantially reduced. These advantages, plus the provision for rapid heat dissipation by forced air circulation, assure cool operation even under severe operating conditions. Cool operation greatly increases friction disc life resulting in less maintenance expense and less press down-time.

QUICK FACTS ABOUT DANLY PRESSES

Capacities: Sizes from 50 to 3,000 tons.

Types: Heavy-Duty Autofeed, Standard Autofeed, 1, 2, and 4-point Straight-Side, Double-Action and Gap Frame types.

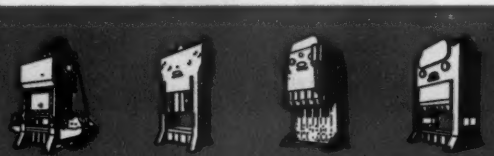
Outstanding Features: Built-in automatic lubrication, extra heavy steel frames, extra long gibbing, built-in wiring and pre-tested electrical controls, and special engineering to suit your needs.

Write For *Free* Literature

Write for more facts today. Find out how the modern outstanding features of Danly Presses will help you increase output and lower your stamping costs.

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52nd AVENUE CHICAGO 50, ILLINOIS

DANLY



OVER 25 YEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY

MECHANICAL PRESSES AND PRESS EQUIPMENT

president, Sylvania Electric Products Inc., New York; treasurer and chairman of the finance committee, **James L. Madden,** second vice president, Metropolitan Life Insurance Co., New York; vice president, Personnel Division, **John S. Bugas,** vice president, industrial relations, Ford Motor Co., Dearborn, Mich.; vice president, Production Division, **Grosvenor S. McKee,** vice president and works manager, Talon Inc., Meadville, Pa.; vice president, Finance Division, **John H. MacDonald,** administrative vice president, National Broadcasting Co. Inc., New York; vice president, Insurance Division, **Russell B. Gallagher,** manager, insurance department, Philco Corp., Philadelphia; and **Harold V. Coes,** retired vice president, Ford, Bacon & Davis Inc., New York, elected vice president at-large.

—o—

David E. Linn has been appointed sales manager of Diamond Steel Co., Chicago. He succeeds **Robert Addison** who has resigned because of ill health.

—o—

John A. Carter, former general manager, Oakite Products Inc., New York, has been elected president of the company, succeeding **D. C. Ball,** founder and longtime president, who becomes chairman of the board. Mr. Carter has been associated with Oakite for 34 years. **David S. Ball,** former vice president, has been elected to the newly created office of first vice president, and **H. Liggett Gray, James Beckett** and **David A. Hearn** have been re-elected to their respective positions of vice president, treasurer and secretary.

—o—

C. D. Ketchum, formerly western regional sales director, Laboratory Equipment Division, Hamilton Mfg. Co., Two Rivers, Wis., has been appointed director of sales, Childcraft Division, succeeding **Earl E. Merrett,** who resigned to head his own company in Kewaunee, Wis. **A. R. Salveson,** formerly eastern sales director, Laboratory Equipment Division, becomes director of sales of the division for the entire country.

—o—

Carl E. Staky is being congratulated this month on completing 25 years of service with the D. J. Murray Mfg. Co., Wausau, Wis. He was appointed general manager in 1930, and has been executive vice president since 1942.

—o—

M. J. Wurzbach, former Cleveland newspaperman, has joined the public relations staff of American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp.

—o—

William Van C. Brandt, one of the pioneers in the battery-powered industrial truck industry, has been appointed managing director of the Electric Industrial Truck Association, Long Island City, N. Y. He will assume his new duties July 1. He succeeds **C. F. Kells,** who left EITA to join a publishing firm. Active in the association for the past 25 years, Mr. Brandt has resigned his position as manager of railway and motive power sales for Electric Storage Battery Co., Philadelphia, to accept the new post. Succeeding Mr. Brandt as vice president of EITA is **M. W. Heinritz,** vice president, Gould Storage Battery Corp., Trenton, N. J.

—o—

Louis S. Morse Sr., executive engineer, York Corp., York, Pa., has been elected the first honorary member of the Air Conditioning & Refrigerating Machinery Association, Washington. Mr. Morse, advisory engineer to the association's general standards committee for many years, has been prominent in the development of ACRMA's equipment standardization program.

—o—

Dr. Fritz V. Lenel and **Dr. Arthur A. Burr** have been made associate professors in the department of metallurgical engineering at Rensselaer Polytechnic Institute, Troy, N. Y. **Ralph R. Nash** has been made an assistant professor in the department.

—o—

Harold C. Miller, former vice president in charge of research and engineering, Charles Hardy Inc., New York, has been named assistant chairman of the physics department of Armour Research Foundation of Illinois Institute of Technology. He will be technical director of the department's electricity and magnetism section, and of the high-pressure laboratory.

—o—

David Thomson has retired as president of Phoenix-Apollo Steel Co., Phoenixville, Pa.

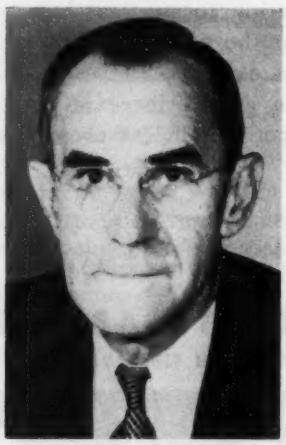
—o—

John W. Clark has been appointed director of sales and executive assistant to the president of Capewell Mfg. Co., Hartford, Conn. In his new capacity he will supervise both the company's domestic sales and export sales organizations. He has been assistant to the president since Jan. 1, and prior to his affiliation with Capewell was connected with Westinghouse Electric International Corp., and for a period of time was an independent merchandising consultant. **P. W. Grace** succeeds Mr. Clark, as assistant to the president.

—o—

National Association of Relay Manufacturers has elected **H. W. Pfeffer** of Struthers-Dunn Inc., Philadelphia, as president for the ensuing year, succeeding **Ralph T. Brengle** of Potter & Brumfield Mfg. Co., Chicago. **H. L. Huntsinger,** RMB Division, Es-

JOHN A. CARTER

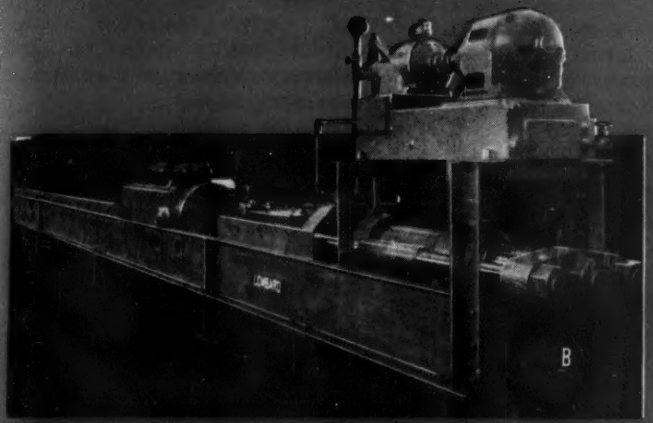


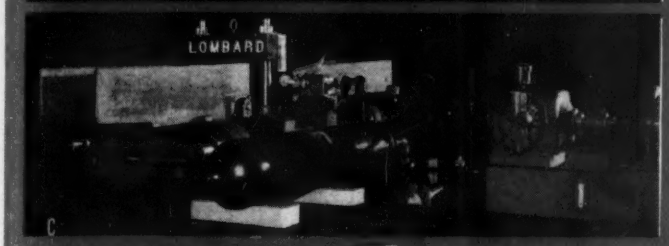
WILLIAM VAN C. BRANDT

JOHN W. CLARK

LOMBARD

All Lombard equipment is designed to meet your particular requirements. We invite you to investigate our facilities and products. All inquiries will receive courteous and prompt attention.



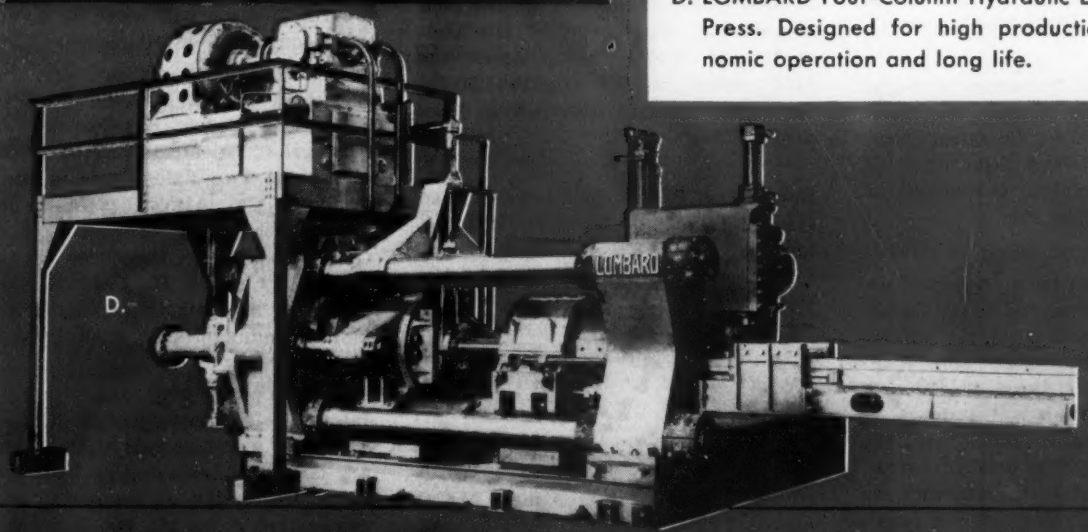


A. LOMBARD Hydraulic Press designed especially for baling jute.

B. LOMBARD Hydraulic Stretcher. Equipped with powered carriage and de-twisting head.

C. LOMBARD Hydraulic Test Bar Shear for cutting hot alloy steel bars while in motion.

D. LOMBARD Four-Column Hydraulic Extrusion Press. Designed for high production, economic operation and long life.



LOMBARD CORPORATION

Engineers and Designers

EMPIRE BUILDING · YOUNGSTOWN 3, OHIO

Equipment Manufactured by United Engineering and Foundry Co., Pittsburgh, Pa.

WILLIAM D. POMEROY

DONALD C. COLEMAN

sex Wire Corp., Logansport, Ind., was elected vice president, and **J. V. Roughan,** Price Electric Corp., Frederick, Md., elected secretary-treasurer. Five directors were also selected, one to be appointed by each of the following member concerns: Potter & Brumfield Mfg. Co., Sigma Instruments Inc., Leach Relay Co., Price Electric Corp. and Allied Control Co. Inc.

—o—

William D. Pomeroy, since 1944 a sales engineer for Snyder Tool & Engineering Co., Detroit, has been appointed sales representative for New York, New Jersey, New England and Pennsylvania. He had former association with Western Electric Co., and Seneca Falls Machine Co. Mr. Pomeroy joined Snyder in 1940 as a machine designer, returned to Seneca Falls Machine Co. for three years as production engineer and rejoined Snyder in 1944 as sales engineer.

—o—

R. S. Van Note, formerly manager of the equipment section, Engineering Division, Davison Chemical Corp., Baltimore, has joined Selas Corp. of America, Philadelphia, as manager of the Dehydrator Division.

—o—

J. M. O'Brien has been appointed assistant sales manager, Klem Chemicals Inc., Dearborn, Mich. He formerly was Southwestern Division manager for Diversey Corp. In his new position Mr. O'Brien will assist **A. J. Pettit,** general sales manager, in the company's plans for further expansion in industrial metal cleaning, as well as in other industries not previously covered.

—o—

Plibrico Jointless Firebrick Co., Chicago, announces appointment of **H. P. Barnes** as manager of the Plibrico Sales & Service Co. at Pittsburgh, and distributor of Plibrico refractory products. The office is located at 921 Empire Bldg., 501 Liberty Ave. Mr. Barnes will maintain a complete boiler setting and installation service.

—o—

A new position, air pollution control engineer, has been created at the Cleveland district steel plant of Republic Steel Corp. **Donald C. Coleman,** assistant superintendent of the coke plant at Republic, and a veteran of 25 years in the steel industry, has been appointed to the new position. He has been with Republic since 1947, and just previously had spent three years with Brazilian Steel Co., and before that with Jones & Laughlin Steel Corp. for 20 years, connected with its by-product coke oven operations.

—o—

Wilbur M. Wilson, research professor of structural engineering in the civil engineering department of the University of Illinois, was named the 11th winner of the Marston Medal for achievement in engineering, Iowa State College.

—o—

Bernard J. Meyer has retired from Fairbanks, Morse & Co., Chicago, after 42 years of association, serving in various executive capacities at the Beloit, Wis., Works, where in 1946 he was appointed assistant general manager. Before his retirement he served a short period as personnel director.

—o—

D. Hayes Murphy, president, Wiremold Co., Hartford, Conn., is the recipient of the first McAuliffe Medal awarded by the Connecticut Diocesan Labor Institute in recognition of his achievement in the field of industrial relations.

—o—

Appointments in the Locomotive & Car Equipment Divisions of General Electric Co., Schenectady, N. Y., are: **H. O. Trumpfheller,** formerly assistant to the manager of manufacturing, appointed manager of manufacturing; **David Blair,** formerly production manager, becomes assistant to the manager in charge of procedures; and **C. E. Shank,** formerly assistant production manager, has been named production manager. **Harold E. Strang,** engineering manager of the Affiliated Manufacturing Cos. department, has been appointed manager of the GE apparatus department's Meter & Instrument Divisions at Lynn, Mass., succeeding **Nicholas M. DuChemin,** recently named an assistant general manager of the department.

—o—

Ray P. Powers has been named manager of quality control for Lincoln-Mercury Division of Ford Motor Co., Dearborn, Mich.

—o—

Fred **A. Dirkes** has been appointed New York sales representative, Jersey Shore Steel Co., Jersey Shore, Pa.

—o—

E. C. Malone, associated with Alabama Power Co., Birmingham, since 1920, and its chief statistician since 1930, has been named assistant to the general manager.

—o—

Alfred C. Viebranz, formerly government sales representative for Electronics Division of Sylvania Electric Products Inc., Boston, has been appointed special representative at Washington. In addition to serving as special representative for the company's Electronics and Radio Divisions, and the central engineering laboratories, he will serve as a technical consultant in all phases of government relations.

—o—

Robert L. Baker has been named manager of sales planning of the Replacement Tire Sales Division, B. F. Goodrich Co., Akron. He has been assistant manager of passenger car tire sales, and is succeeded in that post by **Charles H. Caldwell,** who has been advertising and sales promotion manager for shoe products and sundries.

—o—

John L. Collyer, president, B. F. Goodrich Co., Akron, received the honorary doctor of laws degree from Ohio State University at its spring commencement June 10. **Dr. Howard E. Fritz,** Goodrich vice president-research, was named 1949 winner of the Lamme Medal.

—o—

Roy D. Hall, associated with the Lamp Division, Westinghouse Electric Corp., at Bloomfield, N. J., for

PHILIP K. POULTON
Elected secretary-treasurer, Follansbee Steel Corp., Pittsburgh. Noted in STEEL, June 13 issue, p. 72

HARRY H. LUMLEY
Assistant to the vice president-operations, American Steel & Wire Co., Cleveland. Noted in STEEL, June 13 issue, p. 77

KENNETH D. MANN
Elected board chairman, Firth Sterling Steel & Carbide Corp., McKeesport, Pa. Noted in STEEL, June 13 issue, p. 72

38 years, is the fifth recipient of the medal awarded annually by Stevens Institute of Technology for outstanding achievement in the field of powder metallurgy.

—o—

L. E. Osborne, vice president, official operations, Westinghouse Electric Corp., Pittsburgh, has been assigned staff supervision over all the company's manufacturing activities, including all matters of production and industrial relations. Simultaneously he retains responsibility for five major manufacturing divisions. **James H. Jewell,** recently elected vice president, takes over staff supervision of all sales and marketing on a company-wide basis. **John K. Hodnette,** vice president and head of the Transformer Division, Sharon, Pa., becomes general manager of industrial products, with headquarters at Pittsburgh. **John M. McKibbin,** also a recently elected vice president and former head of advertising and sales promotion, now is appointed general manager of consumer products, with responsibility for operation and distribution of the Appliance Division and Home Radio Division.

—o—

Continental Steel Corp., Kokomo, Ind., announces the following changes in sales representatives for Continental chain link fence in its southern and central Indiana and Illinois-Iowa territories: **John F. Spangler,** appointed sales representative in Illinois-Iowa territory, formerly served by **Jack J. Barrett,** who has been transferred to Indianapolis as sales representative for southern and central Indiana. Mr. Barrett succeeds **J. W. Hunt Jr.,** resigned.

—o—

John S. Michie, formerly of Diebold Inc., Canton, O., has been appointed works manager of Reeves Pulley Co., Columbus, Ind. He succeeds **H. E. Brooks,** who has recently retired after 29 years of service with the company.

OBITUARIES . . .

William R. Timken, 83, co-founder of Timken Roller Bearing Co., Canton, O., who retired in the early 1920s, died June 11 of a stroke at his estate in Croton-on-Hudson, N. Y.

—o—

J. Frederic Byers, 67, chairman, A. M. Byers & Co., Pittsburgh, died June 11 in Roosevelt Hospital, New York.

—o—

John Ballantyne, 49, chairman, Philco Corp., Philadelphia, collapsed and died while making a commencement address at Meadowbrook School, Jenkintown, Pa., June 10.

—o—

F. W. Beach, 76, for many years general sales manager, Mansfield Sheet & Tin Plate Co., now Empire Steel Corp., Mansfield, O., died at Van Nuys, Calif., June 14.

—o—

R. R. Carpenter, 72, director and former vice president, E. I. du Pont de Nemours & Co., Wilmington, Del., died June 11 of coronary thrombosis.

—o—

Walter L. Thompson Jr., 56, assistant sales manager at Pittsburgh for Jones & Laughlin Steel Corp., died recently of a heart attack while driving to work.

—o—

Walter A. Dorsey, 67, who retired three years ago as vice president and general manager of Alloy Cast Steel Co., Marion, O., died June 7.

—o—

Charles W. Guttzeit, 73, former president, Latrobe Electric Steel Co., New York, died recently.

—o—

Franklin C. Cheney, 69, president, Cheney Lime & Cement Co., Birmingham, died recently at his home at Allgood, Ala.

—o—

B. F. Darbyshire, 87, president, Darbyshire Steel Co., El Paso, Tex., died recently.

—o—

Joseph H. Lang, 80, an expert on nonferrous metals, who was formerly head of the tin trading department, American Metals Co., New York, died June 11.

—o—

Gustave Johnson, 56, technical and welding engineering supervisor for Air Reduction Sales Co., Milwaukee, died June 10.

—o—

Marinus Brink, 71, founder and president, Cleveland Cold Rolling Mills Co., Cleveland, died June 14. He organized his company in 1926.

—o—

Sidney H. Phillips, 60, chief process engineer at the El Segundo plant of Douglas Aircraft Co. Inc., Santa Monica, Calif., died recently.

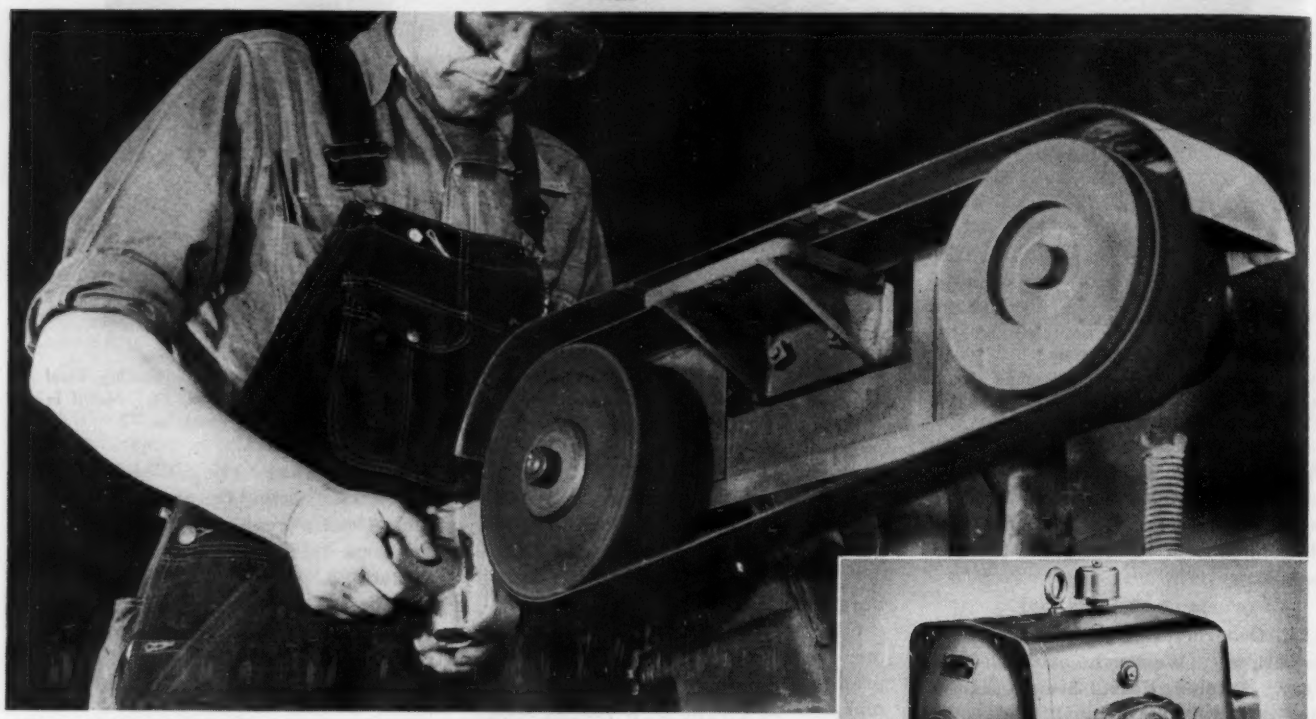
—o—

Edward R. Young, 51, Chicago district manager, Climax Molybdenum Co., New York, died June 9 at his home in Winnetka, Ill.

—o—

Allan R. Taylor, 55, mechanical engineer, Bucyrus-Erie Co., Milwaukee, died recently.

ANOTHER 3M COMPANY SERVICE STORY



QUICK, SMOOTH FINISH for brass and bronze castings with this inexpensive bench backstand grinding unit. Tri-M-ite Cloth Belts backed with a "K" Contact Wheel have speeded metal finishing over three times as fast as previous equipment.

OILGEAR 35 HP TWO-WAY VARIABLE DELIVERY PUMP—typical of the products being turned out *faster* with the help of belt grinding.

Belt grinder pays for itself in one month!

When a 3M Methods Engineer suggested a bench backstand grinder for grinding and finishing brass, bronze and steel castings, steel plates and bar stock at The Oilgear Company, Milwaukee; he may have used the familiar phrase, "It'll pay for itself."

This large user of steel plates, bar stock, forgings and castings gave our Engineer a chance to prove this statement . . . and the equipment saved its original cost during its FIRST month of operation.

Recapturing the cost of a unit of plant equipment in one month is unusual, but we can point out hundreds of users throughout the country who have cut grinding and finishing costs and stepped-up production three to four times over previous methods.

If you grind or finish metals, plastics, wood or glass, flat or contoured surfaces, you'll want more information on this production line cost-cutter—Belt Grinding. The coupon below will bring you an informative booklet and, if you like, the services of a 3M Methods Engineer to help analyze your operations. No obligation, of course.

S-649

Made in U.S.A. by MINNESOTA MINING & MFG. CO., *St. Paul 6, Minn.*
Also makers of "Scotch" pressure-sensitive tapes, "Underseal", "Scotchlite", "3M" Adhesives.

Please send me a copy of your booklet "Step Up Production".
Please send a 3M Methods Engineer to call on me.

*Name*_____
*Firm*_____
*Title*_____
*Address*_____
*City*_____ *Zone*_____ *State*_____

3M® ABRASIVE BELTS

General Export: DUREX ABRASIVES CORP., *New Rochelle, N. Y.* *In Canada:* CANADIAN DUREX ABRASIVES LTD., *Brantford, Ontario*

Engineering News . . . AT A GLANCE

VERSATILE FLAME HARDENING— Four basic methods of flame hardening—spinning, rotary progressive, vertical progressive and combination methods—are possible on an electronic universal flame hardening unit recently developed by Stearns-Roger Mfg. Co., Denver, Colo. Regardless of the method used, the company reports, automatic operation of the machine is so positive that little operator training is required for its operation. Once temperature at which the heating operation is to be run is preset, it is held automatically within very close limits during the heating cycle prior quenching.

DISINTEGRATING PLIERS—Hazards of manual feeding stock into punch presses are eliminated by the unique aluminum alloy feeding pliers currently manufactured by Osborn Mfg. Co., Warsaw, Ind. Although strong enough to handle stock, the pliers completely pulverize if caught in the die. As a result, no damage is done to dies and danger of flying fragments becoming embedded in the operator's face is completely eliminated.

RUBBER "BASED" BRISTLES—In Buffalo, Hewitt Rubber Division, Hewitt-Robins Inc., reports development of a "revolutionary" rotary wire brush in which the steel bristles are mounted or locked in rubber centers. Invented by a 32-year-old Buffalo inventer, Alfred Flohr, the method of construction is said to eliminate localization of bristle fatigue by allowing the wires to flex over a gradual arc of their entire length. Flexibility of the rubber core allows the wire bristles to return upright after each contact with the surface to be brushed, with the result that the maximum number of cutting points are in contact with the work at all times. Exclusive rights of manufacture and sale of the development were acquired by the company about a year ago, but production of the brush began only recently.

NO OVERLOADED BEARINGS—New inboard bearing construction incorporated in the latest rotary pumps produced by Worthington Pump & Machinery Corp., Harrison, N. J., is said to take the load off the main pump bearings, lengthening life of the latter and providing a more rugged product. Bearing is reported to be an adapter type designed so that the inner race is locked to the drive shaft, close to the load center.

CAN TWINNING PROCEDURE— In Milwaukee, it was learned, Acro Welder Mfg. Co. recently supplied S. C. Johnson & Son Inc., with three special spot welding machines which are being used by the latter to "twin" cans automatically at the rate of 160 per minute per machine. Each unit is employed in the filling, capping and packaging production lines where it takes single cans from a conveyor, returning them in pairs. A weld is made at the top and bottom rims of each pair of cans at point of contact, joints being controlled accurately by electronic weld sequence controls. To meet requirements of high-speed production, two special mechanisms are employed in each machine—one imparts a continuous straight line motion to the cans permitting momentary positioning during the weld sequence, the other, synchronized with vertical movement of the two welding heads, positions each pair of cans during the weld sequence and ejects the pair previously welded.

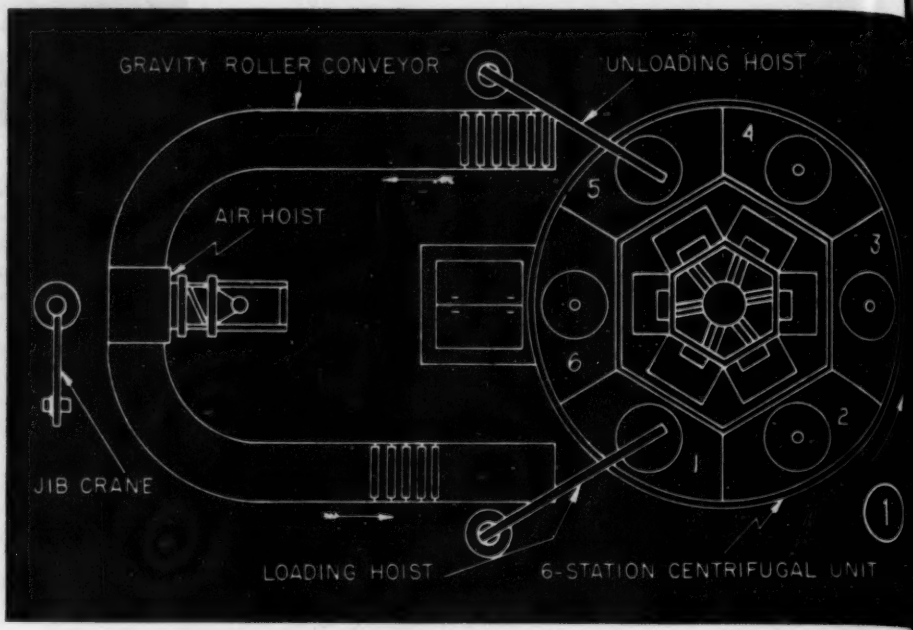
"SPUN" ELECTRODES—To produce electrodes employed in facing friction bearing surfaces of certain sizes of rock bits, Hughes Tool Co., Houston, uses a centrifugal casting method that involves six spinning stations mounted on a large turntable. Rods cast by the technique are reported to provide better welding characteristics, as the chemistry of the electrodes can be controlled effectively by predetermining the losses and controlling the charge. (p. 98)

GAS EFFECTED—Scientists, in attempting to "whip" titanium into shape as a useable material have discovered that gases—nitrogen, oxygen and hydrogen—when dissolved in the metal, decrease its ductility much more effectively than added metals. It is reported that this is true to such an extent that ductile titanium can be defined as metal with a minimum of dissolved gases. Titanium embrittled by hydrogen may be rendered ductile by heating in a vacuum, but no known method of restoring the ductility of titanium embrittled by oxygen or nitrogen is known. (p. 100)

SHEETS IN 3 QUALITIES—In continuing his discussion on the production of hot and cold-rolled strip and sheets, C. L. McGranahan, assistant superintendent, Pittsburgh Works of J & L, points out that an order for sheets for a given purpose specifies one of the following grades—hot rolled commercial, hot rolled special surface or hot rolled physical quality. First quality meets certain flatness requirements and will stand being bent flat on itself for carbon not exceeding 0.15 per cent. The second must have one smooth clean surface with a tightly adherent oxide, or must be capable of being formed without fluting. Last quality mentioned is that possessing properties beyond which would be disclosed by the bend test of the first type. (p. 106)

MECHANICAL "INSPECTORS" — Since tin plate is used in the manufacture of containers for foods and other products of perishable nature, it is essential that the metal be of high quality. Much of the responsibility for this control rests with automatic instruments engineered to do specific chores. (p. 120)

Fewer misruns and other difficulties result from pouring alloy rods used in facing friction bearing surfaces of rock bits, in cast iron permanent chill molds



Centrifugal Casting Welding Rods

THROUGH extensive research over a period of years Hughes Tool Co. has developed materials for facing friction bearing surfaces which are used on the inner end of the bearing shaft of certain sizes of rock bits where space is inadequate to use antifriction roller bearings. These overlay alloy type materials withstand the high impact loads and resist the abrasive action of the lubricant which has access to the bearing surfaces. In order to permit ease in applying the alloys to the base metal they are supplied to the welding departments of the company by the foundry division in the form of welding rods.

Rods in 1/4 and 3/16-inch diameters were originally static cast into sand cores produced in a multiple core box with a common ingate at one end of the rods. The sand cores were baked, sprayed and stacked for pouring. Stacked molds were accumulated for heats melted in a half ton electric arc furnace. The molds were shaken out and the rods broken from the ingates. This method had its disadvantages, as the sand cores would not produce true round rods; there were fins at the parting lines of the mating cores. Also, rods were expensive, as it was necessary to hand grind each one. Many of the rods contained sand inclusions which made application with a welding torch difficult. There were misruns, which increased the amount of scrap. It was felt that the quality of the rod could be improved, but accurate control could not be obtained with the existing method of melting and molding.

In order to improve the quality of the rods produced, and since increased production was required, other production methods were studied. Experimentation indicated that centrifugal casting of the rods was feasible and the rods could be successfully cast in permanent chill molds made of cast iron. Success of these experiments led to the design and installation of the production set-up illustrated in Fig. 1.

Melting furnaces for this system include two 100 pound capacity induction furnaces lined with magnesia crucibles backed with crushed magnesia. High frequency power at 3000 cycles is supplied to either furnace by a 100 kw motor generator set controlled by a single panel board. This control panel is so wired that the 100 kw output can be maintained at a power factor of one by varying the capacitance of the circuit. Approximately 20 minutes are required to melt a 100-pound cold charge when operating at full power output. The motor generator set, capacitance bank and all electrical wiring is located in an air-cooled vault behind the steel doors which are on each side of the control panel.

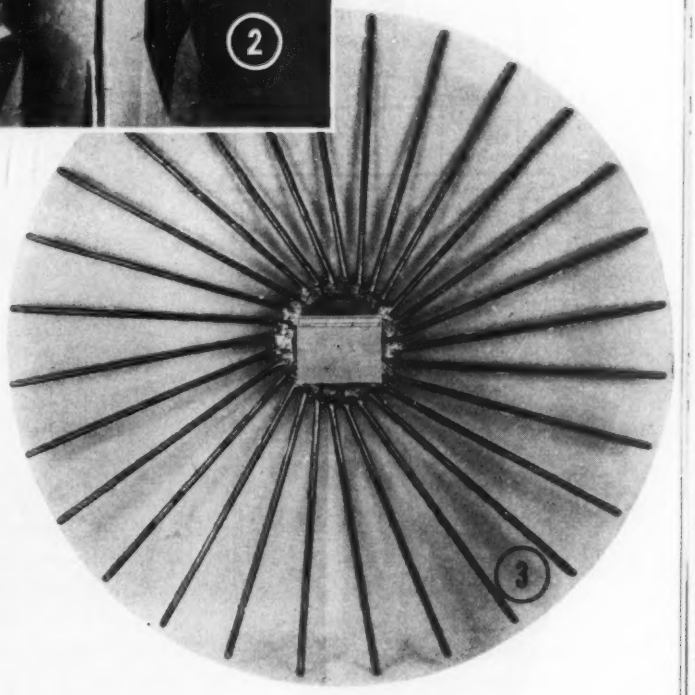
The centrifugal unit consists of six spinning stations mounted on a large turntable. The turntable is automatically operated; time cycle can be varied. The turntable drive is controlled so that each spindle is stopped at the proper station. Cast iron molds are loaded at station 1, Fig. 1. After the set time cycle has passed, the turntable indexes to position 2, where the spinner starts rotating. It is at the desired speed when it indexes to position 3 and the metal is poured from a hand ladle. When the mold passes to position 4, the power is cut off and the spindle stops rotating by the time it arrives at position 5, where it is removed from the turntable by an overhead electric hoist and is placed on the unloading gravity conveyor.

Fig. 1—Plan view of rod casting foundry

Fig. 2—Six-spindle centrifugal casting machine

Fig. 3—Mold of ¼-inch diameter rods in "as cast" condition

By M. W. WILLIAMS
Foundry Manager
Hughes Tool Co.
Houston



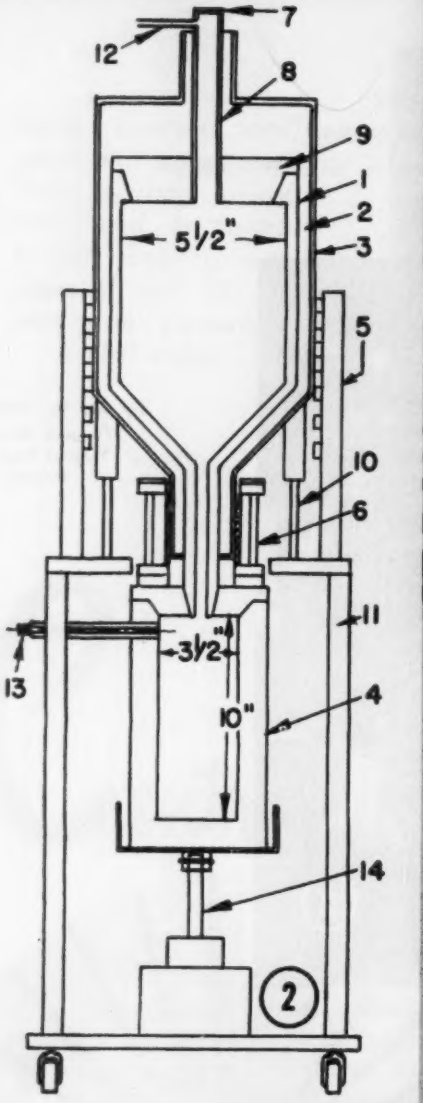
Molds are opened at the air hoist and the rods are removed. Then molds are closed and returned to the loading station of the centrifugal casting machine on the gravity conveyor.

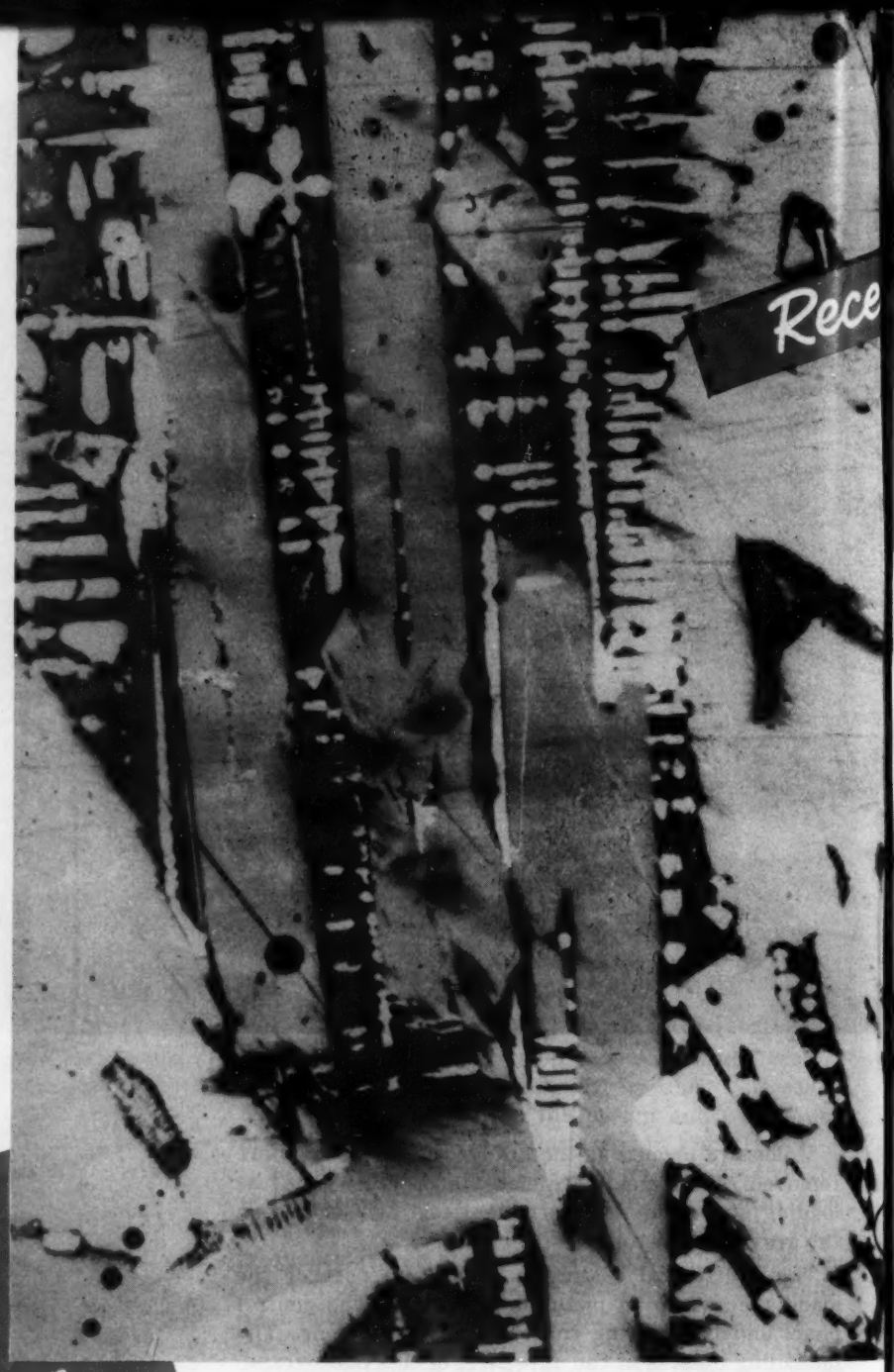
The centrifugal casting machine and part of the loading conveyor is pictured in Fig. 2. The control panel and the melting furnaces are in the rear. The unloading hoist is at the upper left of this photograph.

One mold of rods in their "as-cast" condition is shown in Fig. 3. These rods are broken from the center sprue, inspected and bundled for the storeroom. Note the absence of fins and the excellent surface condition of the rods. Each mold produces 28 rods. The center sprue is returned for remelting. Rotating speed, temperature of the molds and metal temperature must be controlled to produce satisfactory rods at the maximum possible yield.

Considerable work was required to determine the melting characteristics of the small induction furnaces, for it was realized that slight variations in the charge or unusual alloy losses could easily upset the final chemistry of a 100-pound heat. Comparison of melter's calculations and final chemical analyses of a number of heats indicated that the average variation of carbon, silicon and chromium was less than half of 1 per cent. Other elements were found to vary in proportion to their bath reactions. Therefore the chemistry of the rods produced on this equipment can be effectively controlled by predetermining the losses and controlling the charge.

Centrifugally cast welding rods manufactured by this improved method are said to have better quality and weldability. This unit provides for the production of welding rods under more satisfactory working conditions, and has decreased the material handling problem. The combination of these elements into a modern production unit has accomplished increased production and decreased cost.





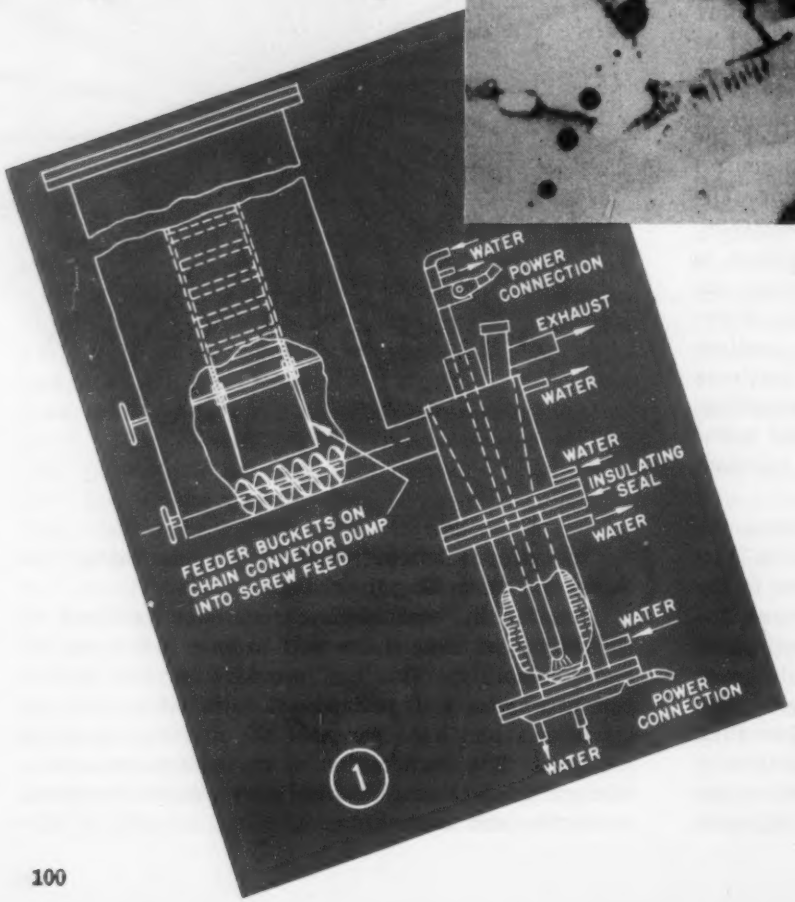


Fig. 1—Schematic drawing of a 5-pound arc furnace developed at Battelle Memorial Institute for melting titanium metal. The furnace is also suitable for production of large ingots

Fig. 2—Ten-pound melting and casting unit for titanium using induction melting in a graphite crucible. Facilities have been installed for casting 100-pound ingots by direct scale-up of this apparatus

Fig. 3—Micrograph of a typical ideal titanium containing slag obtained in smelting of ilmenite in an electric furnace. Shown are large laths of ferruginous magnesium ditanate, dendritic calcium titanate and ground mass of glass

Developments in

Titanium and Titanium Alloys

As a structural material, titanium appears to have a bright future. Recent findings on production properties and metallurgical applications of the pure metal, as reported by leading authorities in the field, are covered in this first section of a two-part article

INTEREST in titanium and its alloys is becoming widespread due to its successful manufacture in ductile form and promise of quantity production in the not too distant future. It is now known that titanium possesses many properties which make it a desirable construction material. A very substantial raw material supply, relatively low specific gravity, good resistance to corrosion, and high tensile properties of titanium are all very desirable characteristics which would normally insure its importance as a structural material.

Commercially pure titanium fills a gap between aluminum alloys and stainless steel insofar as modulus, density and strength at intermediate temperatures are concerned. Its strength-weight ratio as compared to aluminum alloys and stainless steel is favorable, depending on the specific application.

Many interesting possibilities also exist in titanium-base alloys. A number of elements have been listed as alloy possibilities for increasing significantly the tensile strength of titanium. Some improve cold working properties, while aluminum improves both hot and cold working properties and increases its resistance to oxidation. Outstanding yield strength alloys have been found in titanium-chromium alloys which contained molybdenum and tungsten in equi-atomic ratios. Recent advances have also been reported in use of titanium in steel to obtain special properties.

These as well as many other metallurgical topics were subjects of discussion at the recent symposium on titanium sponsored by the Office of Naval Research, with government agencies, research laboratories, and industry participating. At the 168th meeting of the American Institute of Mining and Metallurgical Engineers held recently at San Francisco the metals division placed particular emphasis on titanium. Concerning the use of titanium in steels the Titanium Division of National Lead Co. recently reported on a ferritic low-alloy boron-titanium steel for use at moderately high temperatures.

Production of Titanium—The Metallurgical Division of the Bureau of Mines deserves a great deal of credit for the work they have carried out in developing methods for producing and fabricating titanium. Some of the details of the present manufacturing process for titanium as carried out at Boulder City, Nev., were discussed at the naval symposium by F. S. Wartman, of that division, wherein it was pointed out that after a survey of all known methods of making titanium, the Kroll process was selected for further experimentation and development because it appeared more easily adapted to large scale work than any of the other processes, capable of producing metal of requisite purity.

With reference to purity, it was emphasized that the program at the Boulder City station had as its principal objective the production of titanium pure enough to possess a considerable degree of malleability. In this connection, it was noted that nearly all elements when added to pure titanium, decrease the ductility more or less, but the gases nitrogen, oxygen, and hydrogen, when dissolved in the metal, decrease its ductility much more effectively than do the metals. This is true to such an extent that ductile titanium can be defined as metal with a minimum of dissolved gases. Titanium embrittled by hydrogen may be rendered ductile by heating in a vacuum, but, according to Wartman, no known method of restoring the ductility of titanium embrittled by oxygen or nitrogen is known. It is necessary, therefore, that titanium be produced in an environment substantially free from nitrogen and oxygen if it is to be ductile.

Essentially, the Kroll process for production of titanium consists of reducing titanic chloride by allowing it to react with magnesium contained in a closed iron chamber at a temperature between 800 and 900° C. A protective atmosphere of helium, at a pressure of ½ to 1 pound above atmospheric, is maintained in the reaction chamber during the time it is hot, to protect the contents from oxidation. The principal products of the reaction, it was pointed out by Wartman, are molten magnesium chloride and solid spongy titanium metal together with some unused magnesium. The reaction is exothermic, so that during reduction the supply of fuel or power to the furnace must be curtailed sharply to avoid overheating.

Iodide-Type Titanium—F. B. Litton, Foote Mineral

Co. Laboratories, Philadelphia, in discussing the iodide process for production of titanium metal before the naval symposium brought out the fact that although this process is not operated for large scale production, it is a satisfactory means for producing high purity titanium for studying the metal and its alloys. Ductility of iodide titanium is as much as 55 per cent elongation in 2 inches on standard tensile test specimens. Also, the metal can be cold reduced at least 95 per cent without intermediate anneal. Average tensile properties of sheet iodide titanium may be recorded as follows:

	Annealed*	Cold Rolled**
Ultimate strength, psi.	32,000	107,000
Yield strength, 0.2% offset, psi.	17,500	90,000
Elongation, per cent 2-in.	55	2.5
Reduction of area, per cent	60	30
Modulus of elasticity, psi.	11,200,000	16,200,000

* Vacuum, ½ Hr. at 750° C
** Cold rolled from rod
The average hardness of "as deposited" rod is Rockwell B38 (equivalent to Brinell Hardness Number 73).

In the preparation of pure titanium by the iodide process, crude titanium is reacted with iodine in an evacuated bulb at such temperature to form volatile titanium iodides which are decomposed on a heated titanium filament. Thus it is a purification process in which crude titanium is separated from embrittling elements, such as oxygen, hydrogen, nitrogen and carbon. In addition, it is a consolidating process in that the resulting mass can be drastically cold fabricated into the desired shape.

Melting Titanium—Several papers at the naval symposium dealt with methods for melting and casting titanium. Melting and casting present many difficult problems because the metal has a high melting point and when molten, reacts with virtually everything with which it comes in contact. All oxide refractories are reduced by contact with the molten metal which is then contaminated by both the oxygen and the metallic element, and is embrittled.

Work on melting titanium carried out at Battelle Memorial Institute has resulted in the development of an arc-melting furnace which was described in a symposium paper prepared by O. W. Simmons, C. T. Greenidge, and L. W. Eastwood. While the arc furnace is particularly suited to the rapid production of small ingots without contamination from the atmosphere or crucible material, it is also well adapted to the production of larger ingots. Design of the arc-

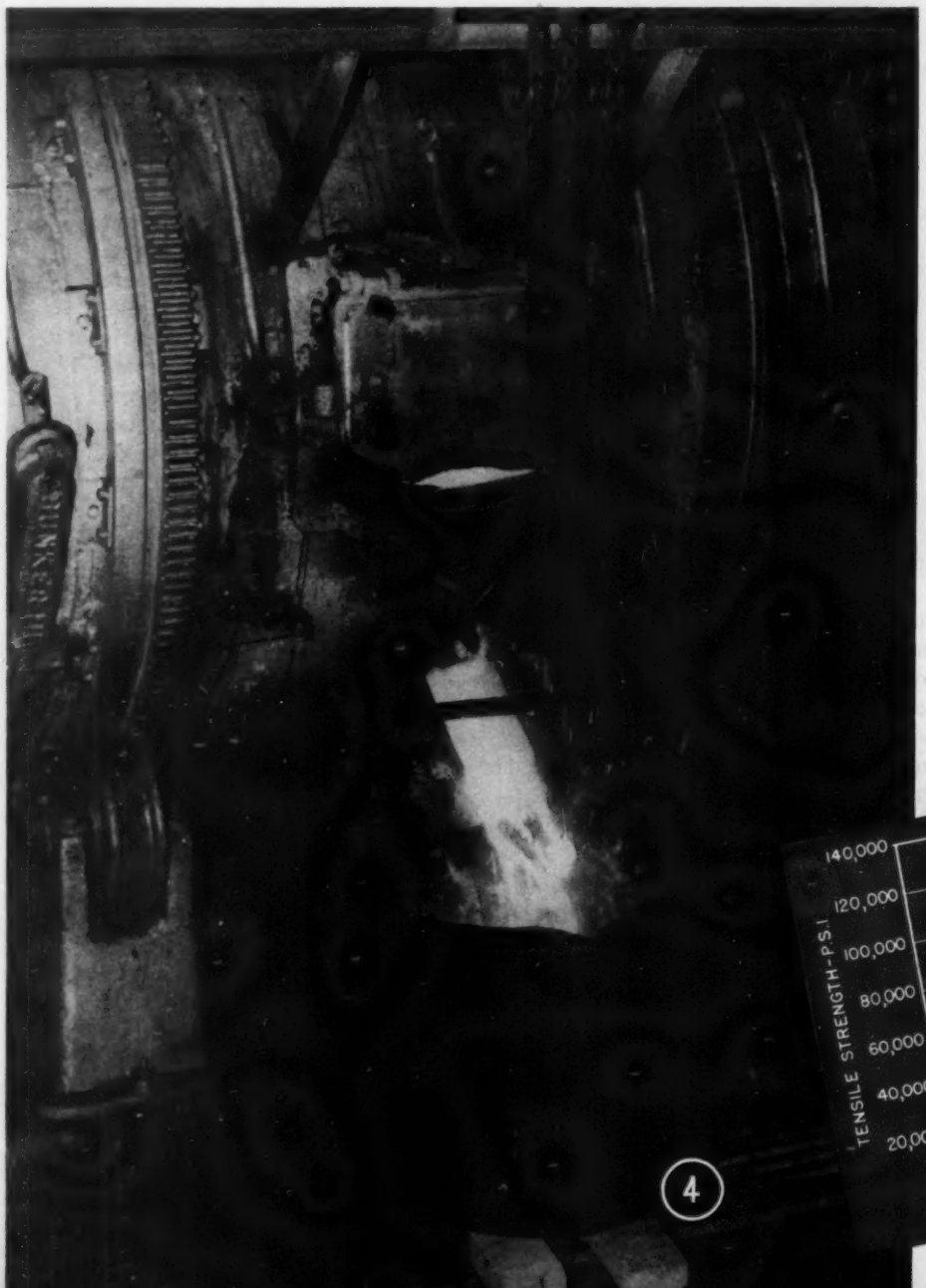
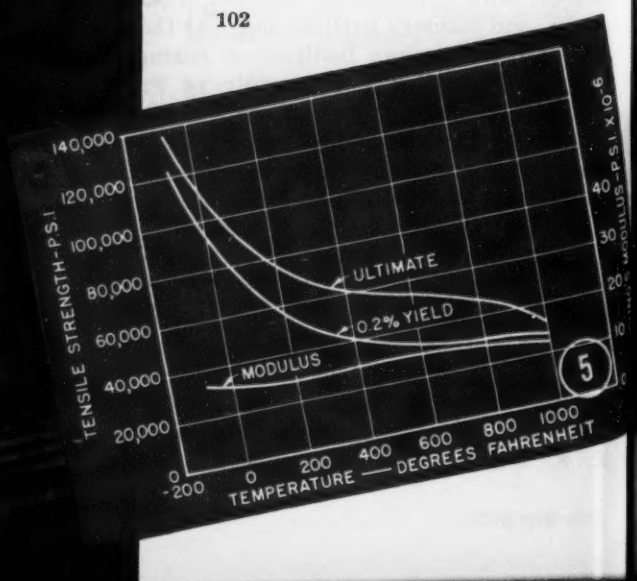


Fig. 4—Pouring from a 2500-pound arc furnace used in smelting ilmenite ores. During the course of this pilot plant investigation reported before the AIME by workers at National Lead Co. and the Bureau of Mines, a total of 36,190 pounds of titanium rich slag and 19,056 pounds of pig iron was produced

Fig. 5—Effect of cold work on tensile properties of Remington Arms Co. commercially pure titanium

Fig. 6—Remington Arms Co. commercially pure titanium forged bar stock tensile properties as a function of temperature

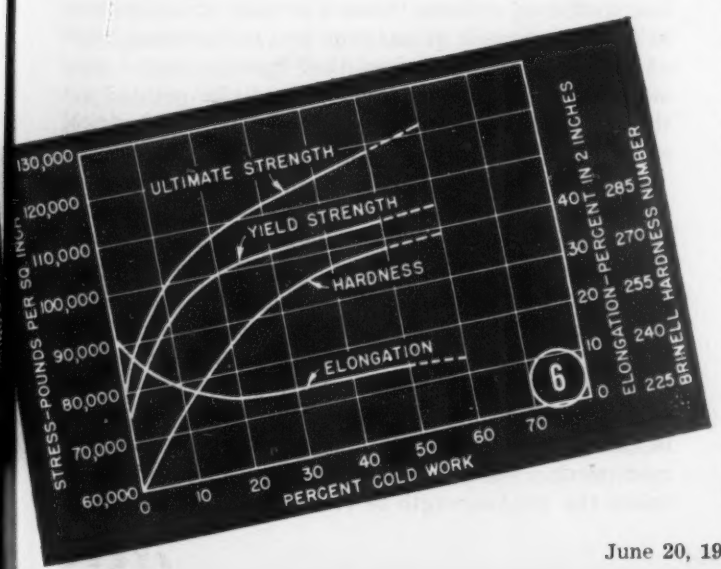


type furnace suitable for handling titanium or other refractory alloys is shown in Fig. 1.

The arc furnace for melting titanium and titanium alloys incorporates the following features: (1) A water-cooled tungsten electrode; (2) a water-cooled copper crucible; (3) a fairly tight melting chamber and alloy addition apparatus, whereby outgassing operations can be carried out; (4) a protective atmosphere consisting of 99.92 per cent argon which effectively prevents contamination of the melt; (5) a device for continuous or semicontinuous addition of the melting charge for the production of small ingots. The Battelle workers also brought out the fact that the furnace is suitable for the production of large ingots, and it was postulated that with relatively little additional work a method of producing continuous ingots of titanium or titanium alloys could be developed.

Melting Titanium in Graphite—J. B. Sutton, pigments dept., E. I. du Pont de Nemours & Co. described before the naval symposium a method for induction melting of titanium metal in graphite. Equipment employed in the production of 10 pound ingots, shown diagrammatically in Fig. 2, consists of the graphite crucible (1), carbon black insulation (2) between the crucible and an outside silica container (3). A pipe extension from the melting crucible fits tightly into the ingot mold (4) which is graphite or water cooled copper. One induction coil (5) surrounds the silica around the melting crucible and a second (6) is located around the pipe connecting the melting crucible to the ingot mold. A sight glass (7) attached to a graphite pipe (8) extending through the top (9) of the melting crucible is used in observing the melting operation and making temperature measurements with an optical pyrometer. Supports (10) for the outside silica container are fastened to a transite top on the main furnace support (11). Argon during heat up, melting and casting operations is introduced through inlets (12) and (13). The ingot mold is raised and lowered by means of a mechanical jack (14). High frequency power is supplied to the two coils from 20 and 5 kw Ajax spark gap converters.

It was brought out by Sutton that the ingots obtained by this melting procedure contain from 0.4 to 0.7 per cent carbon and 99.0 per cent titanium with the remainder, minor impurities present in the 99.5 per cent titanium sponge used in the melt. The ingots vary in "as cast" hardness from slightly below 200 to 240 on the Vickers hardness scale. It was reported that they machine like 18-8 stainless steel and can be readily forged to round or square bars at 1700-1900° F. Hot forged bars can be hot rolled at temperatures of 1200 to 1600° F with about 10 per cent reduction in thickness per pass. It was stated that facilities have been constructed for melting and casting 100-pound ingots by direct scale-up of the 10-pound operation.



Smelting Titanium Ores—The sessions on titanium at the 168th annual AIME meeting all dealt with work being done by the Titanium Division of National Lead Co. and presented extensive data on the nature of titanium in the various forms encountered in smelting and in the smelting technique involved. The first paper in the series discussed melting points in the system TiO_2-CaO-MgO-Al_2O_3 and was prepared by H. Sigurdson and S. S. Cole. It was pointed out that in the $CaTiO_3$-$MgTiO_3$-TiO_2 portion of such a system, a wide range of mixtures melt between 1360-1485° C range and are fluid within 100° C of the melting point. A eutectic of 1360° C was established at 60 mole per cent $MgO.2TiO_2$ and 40 mole per cent CaO.-TiO_2. $Al_2O_3.TiO_2$ when present at more than 30 mole per cent caused a sharp decrease in the fluid melt area, but did not appreciably raise the melting points.

D. L. Armant and S. S. Cole in the second paper of the group, which discussed laboratory smelting of titaniferous ores brought out the fact that the smelting of titaniferous ores in the past has not been successful due to thickening of the slags in the furnace. Indications were that the presence of lower valence titanium oxide and the formation of titanium carbide contributed to the difficulties. The severe reducing conditions prevalent in the blast furnace probably account in part for failures attributed to these factors. As a result of this work, ilmenites having 38-44 per cent TiO_2 were smelted in the laboratory to produce fluid slags with 65-69 per cent TiO_2. It was also brought out that a high titanium slag can be produced in which the formation of appreciable amounts of Ti^{+3} can be avoided.

Petrology of high titanium slags was the subject of the third paper presented by C. H. Moore Jr. and Harold Sigurdson, wherein it was pointed out that (Fe, Mg)O.$2TiO_2$, as produced in the slag, shows a complete isomorphorus replacement of iron by magnesium. It also forms a solid solution with as high as 12 moles of TiO_2 under reducing conditions without the occurrence of rutile or reduced titanium oxide in the slag. It was pointed out that this property has made it possible to form successfully a low iron, high titanium slag with minimum amounts of flux additions.

One of the highlights of the AIME titanium session was a report by C. K. Stoddard, S. S. Cole, L. T. Eck, all of National Lead Co. and C. W. Davis, Bureau of Mines which described a relatively large scale test on the removal of iron from ilmenite ore by electric furnace smelting. In the course of the investigation a total of 36,190 pounds of titanium

rich slag and 19,057 pounds of pig iron were produced. According to the authors, the investigation indicates that the method can be of importance to the titanium pigment industry, as the removal of the iron greatly reduces: (1) The amount of sulphuric acid required to dissolve the titanium dioxide; (2) the subsequent burden of removing the ferrous sulphate from the solutions; and (3) the ultimate disposal problem of ferrous sulphate which has a limited market. The iron is obtained as a pig iron that has a better market.

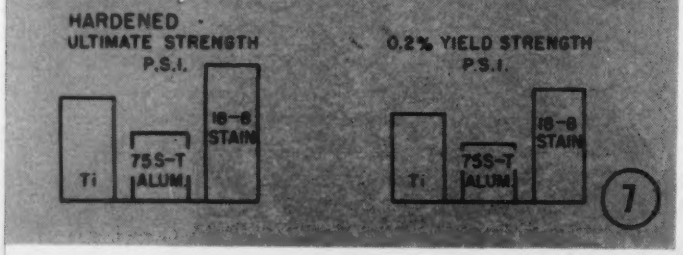
Method developed is limited to ilmenite ores in which the titanium dioxide is diluted with iron oxides, usually magnetite, which can be reduced readily by carbon. It was pointed out that this must be accomplished with only small or negligible additions of fluxes so that the resulting slag will be substantially enriched in titanium dioxide. Preliminary work in the research laboratories of the titanium division of National Lead Co. established that this can be accomplished by using calcium and magnesium oxides. Slags containing 65-70 per cent titanium dioxide are readily obtained from titaniferous ores originally containing 30-45 per cent titanium dioxide.

Solubility of these slags indicates that they are acceptable raw material for the production of pigment. Fig. 3 is a micrograph of a typical ideal slag, showing large laths of ferruginous magnesium ditanate, dendritic calcium titanante and ground mass of glass. Fig. 4 shows the 2500-pound arc furnace used in the investigation of ilmenite ore smelting techniques.

"Sheath Rolling" Titanium Powder—A new process for consolidation of titanium powder, known as "sheath rolling," described before the naval symposium by J. R. Long, permits the fabrication of an almost unlimited mass of metal into a single piece. Although the new method of consolidation was developed for titanium, it was pointed out that it has a wide range of application to other metal powders or fragments. Chromium, tantalum, tungsten, molybdenum, beryllium, cobalt, iron, nickel, and copper powders have been consolidated successfully by sheath rolling techniques.

The new method described by Long consists of sealing the titanium powder in metal containers and rolling the assembly at elevated temperature. It was reported that sheath rolled titanium is dense and sound in contrast with the porous compact obtained by pressing and sintering. Sheath rolled titanium is ductile and can be further cold worked, and was reported to be equivalent in structure to sintered titanium that has been worked and annealed. Some of the mechanical properties of titanium produced by both methods are given in Table I.

Fig. 7—Comparative tensile strength properties at room temperature of commercially pure titanium, 75 S-T aluminum and 18-8 stainless steel. Prepared by Remington Arms Co. Inc.



Common hot rolled sheet or pipe was reported to be satisfactory for use as sheaths to protect the titanium powder and confine it during working. Compacts are usually worked at 1650° F, although temperatures ranging from 1475 to 1825° F have also been used. It was reported that the sheaths can be removed readily from the finished metal. Contamination of the titanium surface by iron is slight and can be removed easily by pickling. The air in the sheath should either be replaced by an inert gas before the final sealing, or its volume should be reduced to a negligible amount by the use of a closely fitting sheath to give a large ratio of metal to residual air. It was pointed out that the hydrogen normally present in titanium powder will embrittle the metal unless it is removed before the metal is consolidated. This is accomplished by pumping out the hydrogen at temperatures between 1300 and 1475° F.

Physical and Mechanical Properties—C. I. Bradford of Remington Arms Co., in discussing the properties of commercially pure titanium before the naval symposium stated that the metal has a density that is intermediate between aluminum and iron, and its melting point and strength are higher than both aluminum and iron. Data on the more pertinent physical properties of titanium compared with 75ST aluminum alloy and 18-8 austenitic stainless steel are given in Table II presented by Bradford before the symposium.

Continuing the discussion of the physical properties of commercially pure titanium, Bradford indicated that Young's modulus for titanium is intermediate between that of the aluminum alloys and that of steel. It was brought out that this relatively high modulus makes titanium a good structural material. The extremely high melting point for titanium should develop into considerable advantage for the metal, when used in high temperature mechanical devices. The low coefficient of thermal expansion will be another advantage for titanium in applications that require high temperature exposure. This low coefficient reduces thermal stresses to a minimum in structures made of titanium and makes close tolerances practical for devices that operate over a considerable temperature range. It was also pointed out that titanium has relatively low thermal and electrical conductivity.

Fig. 5, presented by Bradford, shows the effect of cold work on the tensile properties of Remington commercially pure titanium. In this figure, ultimate tensile strength, 0.2 per cent yield strength, elongation and hardness are plotted against cold work. One significant point brought out in the curves of Fig. 5, is the relatively high tensile and yield strengths of the annealed material in combination with good elongation. A second factor is the increase in tensile properties with only moderate amounts of cold work. For example, 20 per cent cold work raises the yield strength to (*Please turn to Page* 132)

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

MAHOMETS GO TO MOUNTAINS: This week I have joined a "hegira" of several hundred men interested in new things in machine tools. These hegiras have started from Chicago and Detroit and Cleveland and many other important metalworking centers—not only in the middle west but in the middle Atlantic and the New England states as well. All have converged upon the Springfield-Windsor machine tool manufacturing region in the mountains of eastern Vermont.

In the Koran of the machine tool industry there are no strictures against any builder exhibiting his own new developments to his own customers and prospects in his own shop. By the same token, there are no strictures against a number of machine tool builders doing this simultaneously and swapping the customers and prospects around, in which process those customers and prospects get to breathe some mountain air, to view some attractive scenery, to enjoy New England hospitality, and possibly get in a bit of golf and trout fishing "on the side".

Unlike the proprietors of the traditional mouse trap factory out in the woods, officials of Bryant Chucking Grinder Co., Fellows Gear Shaper Co. and Jones & Lamson Machine Co. of Springfield, and Cone Automatic Machine Co. Inc. of Windsor, are not depending upon their mutual visitors "beating pathways" to their respective doors. On the contrary, they are making the pathways easy by meeting their guests at Albany and Charlestown, N. H., and elsewhere, and providing "shop door delivery" by a fleet of automobiles recruited by the joint entertainment committee.

Since 1828—which was 20 years before the railroad penetrated the upper valley of the Connecticut River—men have been journeying from the Springfield-Windsor region to the far corners of the earth, selling machinery. The fact that during the past 120 years an unbroken chain of industries not only has distributed untold millions of dollars worth of machines but also has survived wars and depressions and technological changes, speaks well for the Yankee ingenuity, the industrial virility and for the selling ability of the men who have perpetuated and expanded those industries.

As a native of Windsor and as a "graduate" of a machine tool shop in that town who has a valued circle of friends in the Springfield-Windsor machine tool plants, it does my heart good to join so many "Mahomets of the Metalworking Industry" in this mass migration to the mountains of Vermont. In forthcoming issues of STEEL I will report more in detail upon this refreshing variation in the pattern of machine tools salesmanship and upon the new designs which are being unveiled and demonstrated.

POWER IN SMALLER PACKAGES: At any convention a speaker whose presentation is scheduled for "the morning after the night before" is apt to find himself dealing with a sleepy and inattentive audience. Faced with that possibility on the morning of June 8, the morning after the annual dinner of American Gear Manufacturers Association at Hot Springs, Va., Howard W. Bennett, manager, Gear Motor Sales Division, General Electric Co., got under way with an "eye-opener" which instantly snapped his audience out of its lethargy and drove home some points.

Just as he began his talk on "The Gear Motor—Symbol of Packaged Power", he was interrupted by two stevedores of gay nineties vintage who staggered upon the stage with a battered wheelbarrow. A crash resounded throughout the auditorium as they dumped about 450 pounds of ponderous gears, pinions, shafts and other clumsy details which had gone to make up the "gear end" of some remote ancestor of the modern gear motor. As the dust and echoes subsided, two "moderns" strolled up on the stage. Between them on a trestle they easily carried the complete, neatly styled assembly (both motor and gear end) of a 1949 version of a gear motor of much greater horsepower than ever was transmitted by the mechanism represented by the pile of junk on the floor.

"A glance at this intricate mass of old-fashioned shafting and gears shows how little emphasis used to be put on compactness and neat appearance," remarked Mr. Bennett to his now thoroughly awakened audience. "When industry finally became sold on the flexibility and exact control which go with well engineered individual machine drives, compactness finally became not only desirable but mandatory. And so it came about that with the advent of compact, neatly styled units such as that on the trestle, the gear motor industry grew from practically nothing to an annual business of between ten and fifteen millions of dollars—all within a period of five years."

CONNELL AWARD TO CANDEE: Birth in a log cabin used to be a highly desirable start for one who aspired to the presidency of the United States. Now it appears that engineers born in a log cabin or its equivalent have a better than average chance to receive the Connell Award, a high honor accorded annually by American Gear Manufacturers Association.

John Otto Almen, research consultant of General Motors, who received the award three years ago, came into the world in a sod house on the Nebraska prairies. Now comes Harry Allen Candee, mechanical engineer, Gleason Works, born in a log cabin in Colorado.

While the geography of America has little to do with the birth of genius, development and practice of engineering talent certainly has tended to send young men of the caliber of Almen and Candee on migrations in a direction opposite to that recommended by Horace Greeley. With the westward flow of the tide of industrial empire, there may come a time, however, when more geniuses born in the west will be able to carve out their engineering careers in the west.

FUNDAMENTALS of STEELMAKING

NUMBER 9 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

By CHARLES L. McGRANAHAN
Assistant General Superintendent, Pittsburgh Works
Jones & Laughlin Steel Corp.
Pittsburgh

Production Of

HOT and COLD-ROLLED Strip and Sheets

In this third section, the author presents a discussion of quality classifications for sheets, finishing of hot-rolled sheets, sheet pickling, shearing lines and a description of the continuous pickling process

PART III

AN ORDER for sheets for a given purpose specifies one of the following grades: Hot-rolled commercial quality, hot-rolled special surface quality or hot-rolled physical quality.

Hot-rolled commercial quality steel sheets carry the mill oxide, meet certain flatness requirements and will stand being bent flat on themselves for carbon not exceeding 0.15 per cent. For carbon ranges of 0.15 up to 0.25 per cent, the test piece will stand bending 180 degrees in any direction around a mandrel equal in thickness to that of the specimen.

Hot-rolled special surface quality steel sheets must have one smooth, clean surface with a tightly adherent oxide, or are capable of being formed without fluting or must be free of surface defects which would be disclosed on pickling or blast cleaning by the fabricator. The bend test requirements for hot-rolled commercial quality sheets also applies to this grade.

Hot-rolled physical quality steel sheets are those possessing properties beyond those which would be disclosed by the bend tests of hot-rolled commercial quality. These properties are such that they would be included by tensile tests; ability to stand pressing into specific stamping; meeting certain tempers; and freedom from stretcher strains immediately after roller leveling. Tensile tests and chemical limits are usually not specified at the same time, neither are physical tests and drawing properties. If more than one condition is imposed, it constitutes an additional hazard of manufacture.

There are three classes of hot-rolled-pickled sheets which may be specified as follows: Hot-rolled pickled commercial quality, hot-rolled-pickled physical quality and hot-rolled-pickled drawing quality.

Hot-rolled-pickled commercial quality sheets are used for ordinary flat or forming work where freedom from mill scale or oxide is desirable and they may be nonfluting when desired. The bend test for hot-rolled commercial quality sheets is the only physical test applicable to this grade.

Hot-rolled-pickled physical quality sheets are spec-

Fig. 21—Shearing line for finishing sheets which have been cut to length on a hot flying shear. United Engineering photo

ified where the mill oxide is objectionable and physical properties are equivalent to those of hot-rolled physical quality.

Hot-rolled-pickled drawing quality is a grade that is suitable for deep drawing. Ability to meet drawing requirements is the primary characteristic of this grade which is specified when the sheet manufacturer is held responsible for breakage within certain established limits. Sheets of this grade are usually furnished in the dead-soft state and are thus relatively free from aging, but will show stretcher strain when drawn.

Hot-rolled-pickled sheets may be produced by: 1—Hot rolling to gage, followed by pickling before or after annealing; then flattening by cold rolling without appreciably reducing the thickness, or by roller leveler, or both. 2—In the range of 19 to 22 gage inclusive, by continuous pickling a hot-rolled strip and cold reducing to required thickness, then shearing to length, annealing and roller leveling. If freedom from stretcher strains and flatness is desired it is necessary to give the sheet a pass through a cold mill or temper pass mill.

Finishing operations on hot-rolled sheets which have been rough cut on the hot flying-shear varies somewhat with gage, final surface requirements, and physical properties.

Commercial quality sheets, 12 gage and heavier and 48 inches wide and narrower, are usually processed ready for shipment on a sheet finishing line consisting of a pack tilting device, a rotary side trimmer, a roller leveler, an end shear with gage and a piler, Fig. 21. The multiple cut, produced by the hot flying shear, is first side-trimmed, roller leveled to remove cooling distortion and edge waves caused by side-trimming, then cut square and to proper shipping lengths by the end shear which is usually of the up-cut design, such construction improving visibility along the shearing unit. Shearing lines of this type have capacities of from 15 to 25 tons per hour.

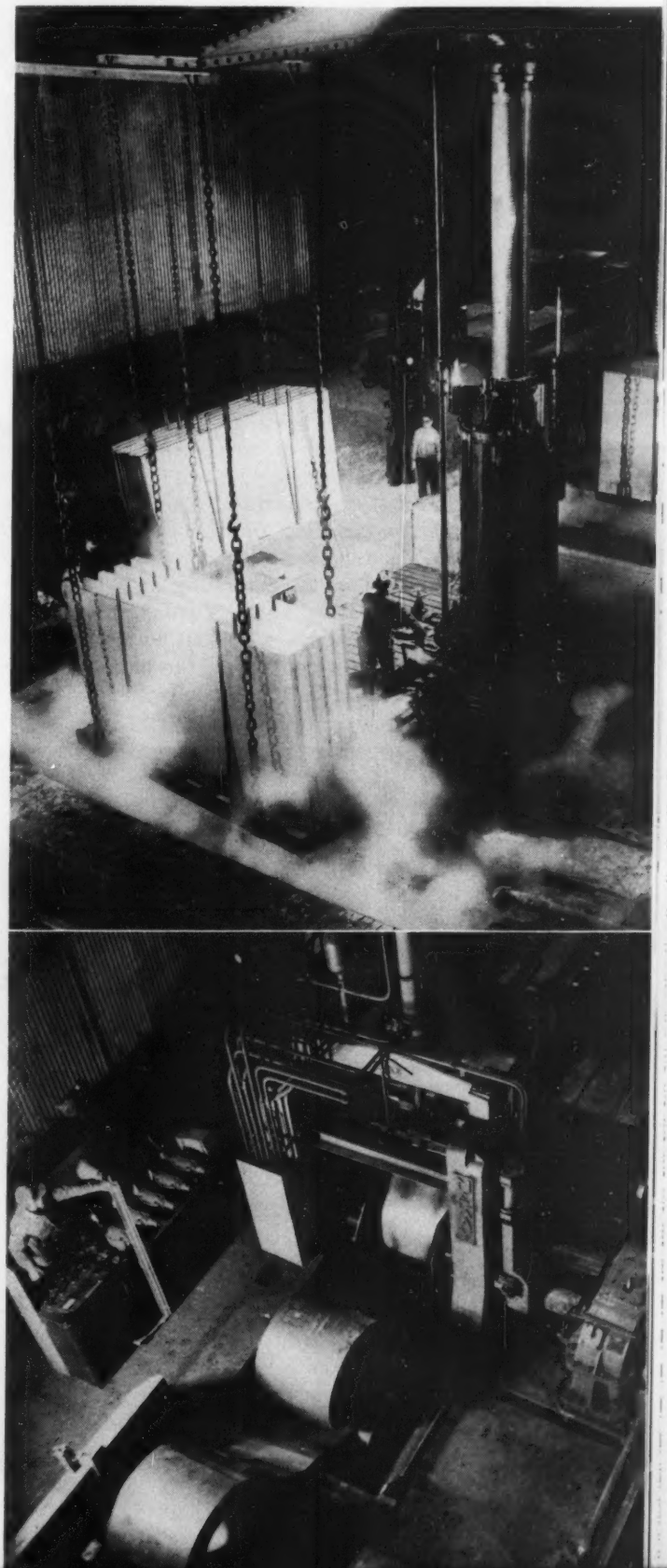
When widths exceed those mentioned previously, it is customary to rough cut the hot-rolled multiple to approximate finished length, then skin-roll (cold-roll) for flatness on a two-high cold mill, and give a final shearing on a finishing line as described above or on one which is equipped with two end-shears rather than with a single up-cut shear and gage. One shear of such a unit is made movable to provide for different lengths and is equipped with motors and controls for speedy adjustment.

A skin pass mill is usually equipped with rolls varying from 28 to 32 inches in diameter and at least 6 inches wider than the maximum sheet width which will be rolled through it. A sheet tilter is usually provided for facilitating feeding of the mill which is always followed by a roller leveler, preferably one equipped with backing-up rolls. Gas burners installed on the mill's delivery side are used to shape the top roll of the mill to fit the sheets to be skin passed. In the hands of a capable operator, such a mill will produce hot-rolled sheets of practically stretcher leveled flatness.

Removal of mill scale or oxide by means of an acid bath is an operation termed pickling and is usually

Fig. 22 (top)—Changing crates on a plunger type pickling unit. Note tractor and buggy for hauling pickling crates to scrubbing and drying unit. Mesta Machine photo

Fig. 23 (bottom)—McKay processor with an expanding mandrel and a regenerative drag motor at the entry end of a continuous pickling line for tin plate coils. J. & L. photo



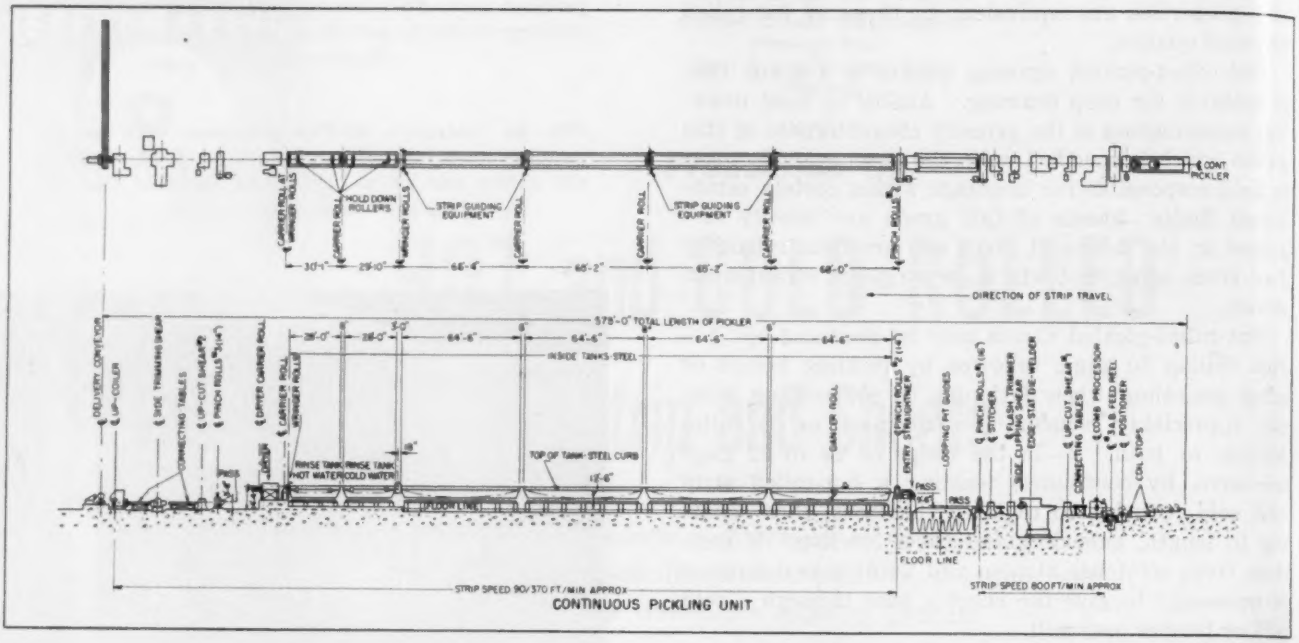


Fig. 24—Sketch showing general arrangement of equipment included in a modern continuous pickling line. Mesta Machine drawing

accomplished in one of two manners, i.e., by batch pickling or continuous pickling.

Batch pickling may be performed by immersing the sheets in a solution of acid where they remain stationary or where they may be agitated by a rocker type or plunger type machine. The most popular type machine for handling 18-gage and heavier hot-rolled sheets is the Mesta plunger-type patented pickling machine, Fig. 22, consisting of a base, vertical cylinder, operating valve, piston, plunger and top. The plunger carries a set of horizontal arms from which the crates containing the material to be pickled are suspended. A three-arm pickling machine will be equipped with two tanks or vats and a four-arm machine will have three tanks which are rectangular in shape and may be constructed of wood or acid-proof brick laid in acid-proof cement. One acid tank and one fresh water or wash tank are essential, however, a second acid tank making a total of three tanks gives increased production and improved surface on certain grades. Acid content of the first tank varies from 5 to 10 per cent and that of the second tank, when used, varies from 2 to 5 per cent. Tanks are usually heated by steam and held at a temperature of from 140 to 180° F. It will be noted from the picture of the machine that the acid-proof bronze or Monel metal crates carry pins for supporting sheets in a vertical position. It is desirable when pickling very heavy sheets, to further separate them with Monel metal wire shaped like hair pins. These wires are hooked over the top of each sheet and permit a more uniform flow of liquid during the pickling and washing operation. That portion of the supporting chain for crates which becomes submerged must be of the same acid resisting metal as the crates themselves. While the total stroke of the mast may be up to 9 feet, only about 15 inches is used for pickling, the balance being utilized only when changing the crates from tank to tank. The full stroke is performed under control of the operator and when the plunger is lowered to its bottom position, an automatic sliding valve takes control until the machine is ready for the next step in its cycle of operation. Loading of an empty crate may be performed at the machine where the crate rests upon a bench or it may be performed some distance away and carried to the machine on a truck from which po-

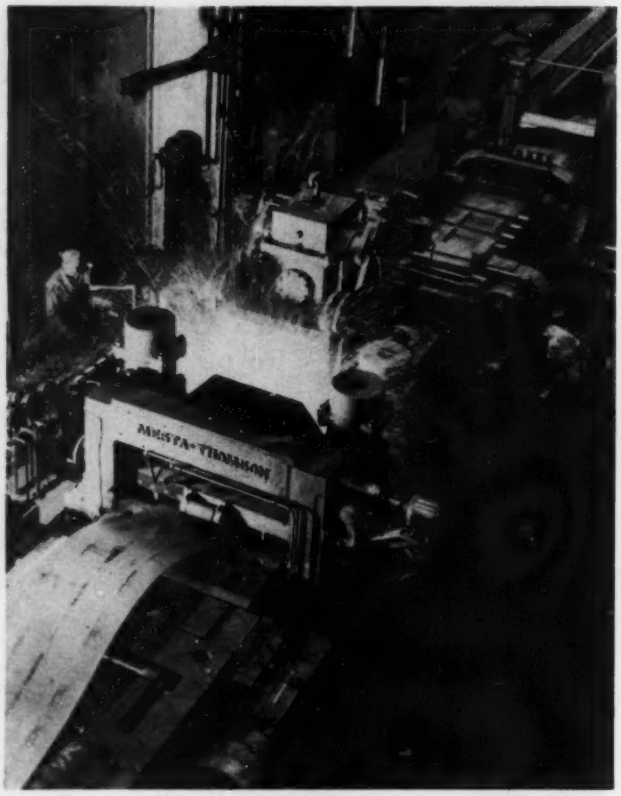
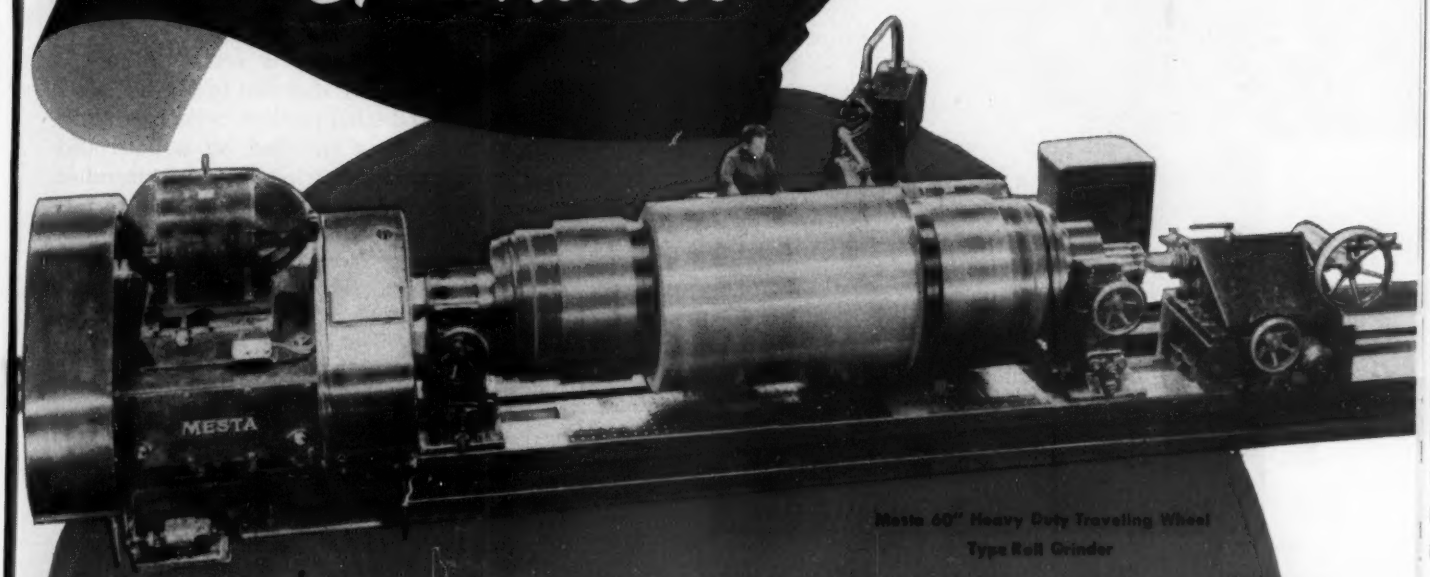


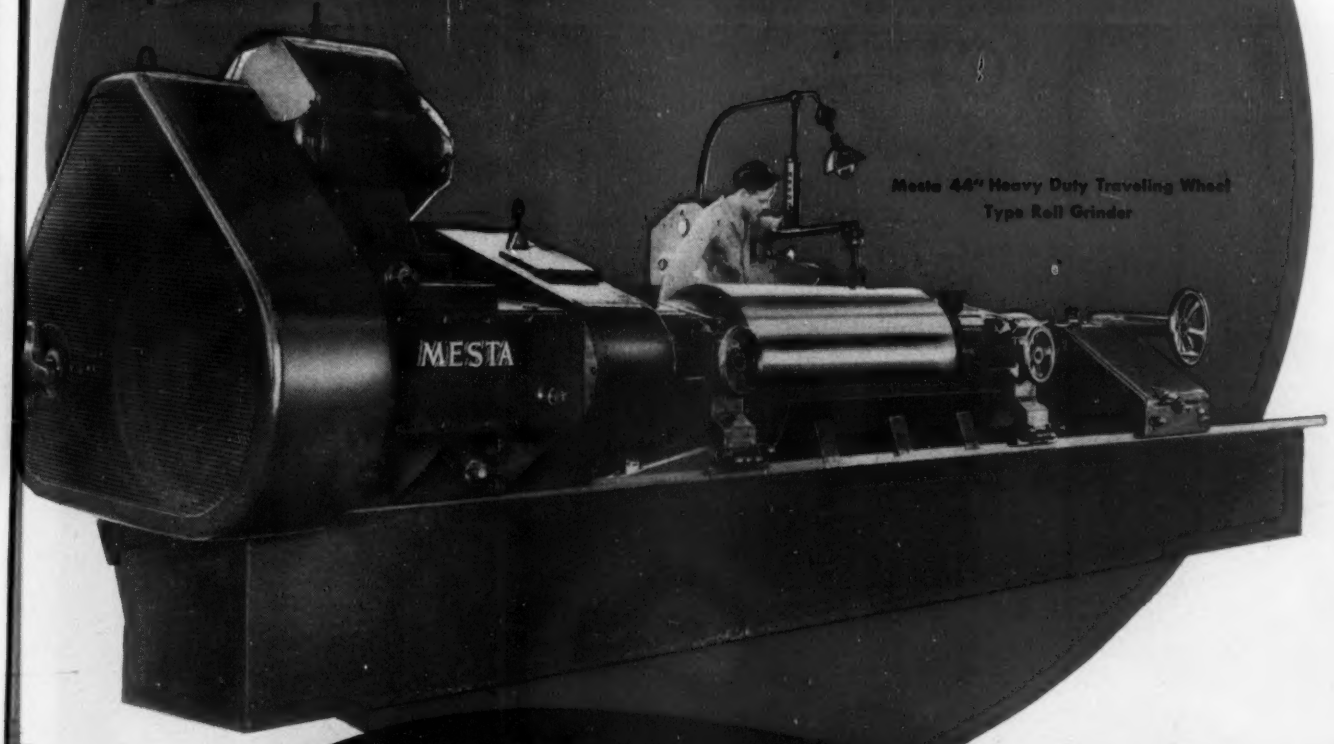
Fig. 25—Flash welder used for joining ends of tin plate coils on a continuous pickling line. J. & L. photo

MESTA
Roll Grinders

Mesta Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.



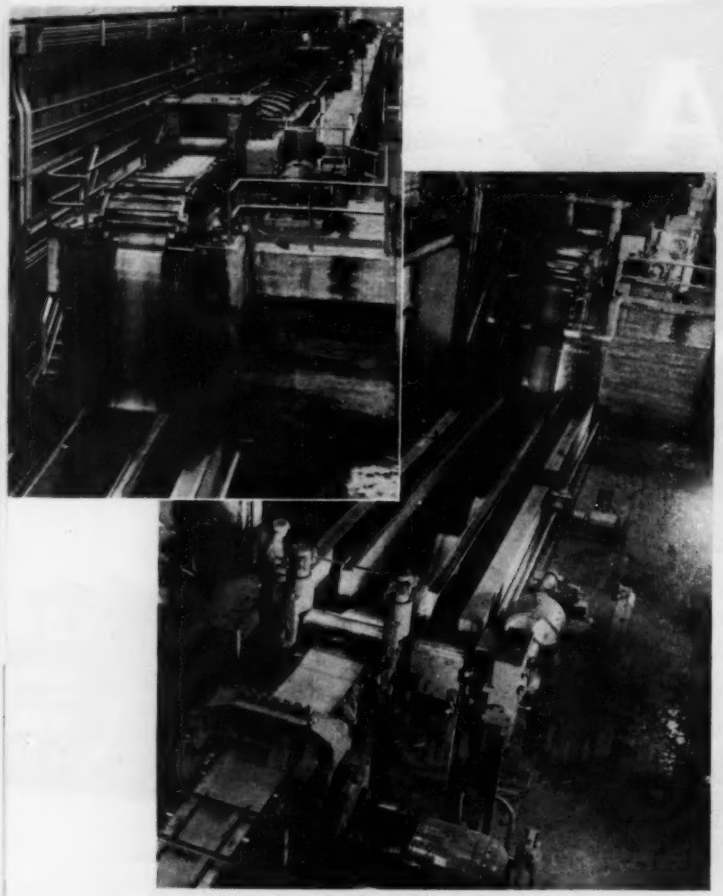
Mesta 60" Heavy Duty Traveling Wheel Type Roll Grinder



Mesta 44" Heavy Duty Traveling Wheel Type Roll Grinder

Designers and Builders of Complete Steel Plants

MESTA MACHINE CO., PITTSBURGH, PA.

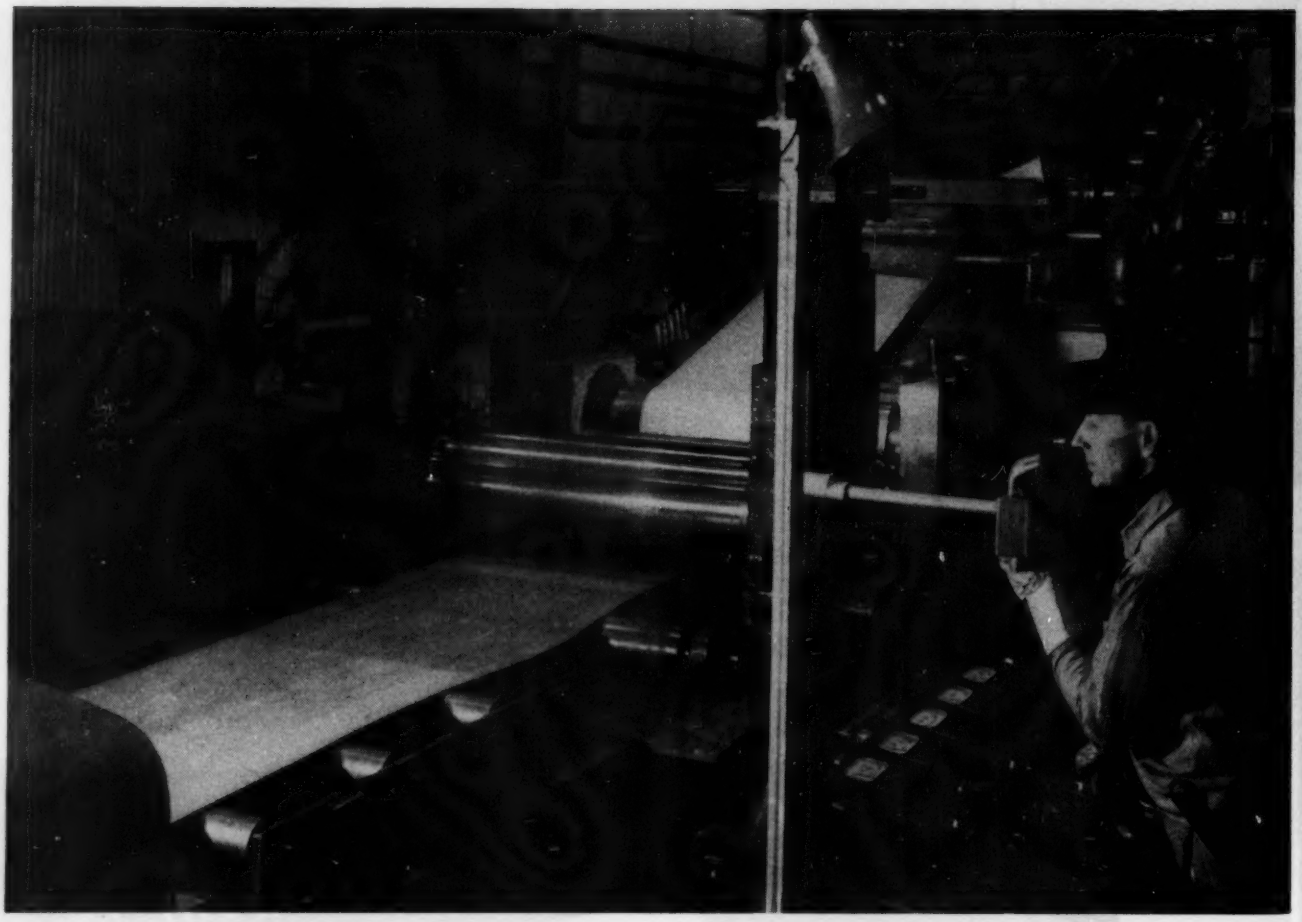


sition it is lifted by the plunger, swung around over the acid tank and lowered into the acid bath. The operator then controls the number of strokes per minute by manipulation of the main steam throttle and a similar valve on the exhaust line. The automatic valve assumes control, raising and lowering the mast with its load of crates immersed in the acid tanks and wash water tank, until the loads are ready to be raised by hand control.

The pickled and washed sheets still carry sufficient acid solution to cause staining when exposed to air so it is customary to pass the sheets individually through a scrubbing and drying unit consisting of a muriatic acid bath followed by fresh water sprays, rubber drying rolls and a conveyor table, over and under of which are mounted hot air ducts and nozzles. An oiling machine is frequently included in the line when a hot-rolled-pickled and oiled product is desired. When a bright smooth finish is specified on a hot-rolled-pickled item, the pickled and dried sheet is skin-rolled, resheared and then oiled as it is not practical to take

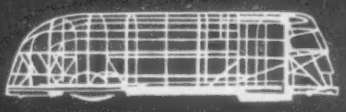
Fig. 26—(*left*) *Views showing stitcher in foreground, No.* 1 *pinch rolls, looping pit, entry end of pickling tanks, uncoiling device for preventing double sheets from entering No.* 2 *pinch rolls and the four* 80-*foot acid tanks of a modern narrow pickling line. J. & L. photos*

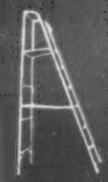
Fig. 27—(*below*) *Control station for regulating speed of the pickling operation also the air dryer and No.* 3 *set of pinch rolls on the delivery end of the pickling tanks. J. & L. photo*

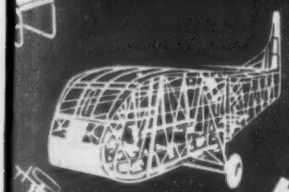


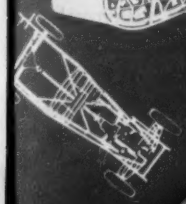
Michigan WELDED STEEL TUBING

The Modern Electric Resistance Welded Steel Tubing









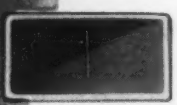
LIGHT WEIGHT · UNIFORM STRENGTH · ECONOMICAL · MACHINE-ABILITY

ROUND

¼" to 4" O. D. 9 to 22 gauge

SQUARE

½" to 2" 20 gauge —1" to 2¾" 14, 16, 18 gauge



RECTANGULAR

½" to 2" 20 gauge—1" to 2¾" 14, 16, 18 gauge

Men of Vision,

The nation's engineers and product designers are finding new applications for electric resistance welded steel tubing undreamed-of a few short years ago. MICHIGAN WELDED STEEL TUBING is being used in the manufacture of thousands of different products ranging from toys, home and office equipment, to intricate industrial fabrications. Available in round, square and rectangular shapes in a wide variety of sizes for working in your plant or prefabricated by Michigan.

Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

Michigan STEEL TUBE PRODUCTS CO.

More Than 30 Years in the Business

9450 BUFFALO STREET • DETROIT 12, MICHIGAN

FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Drummond, McCall & Co., Ltd., Toronto, Canada

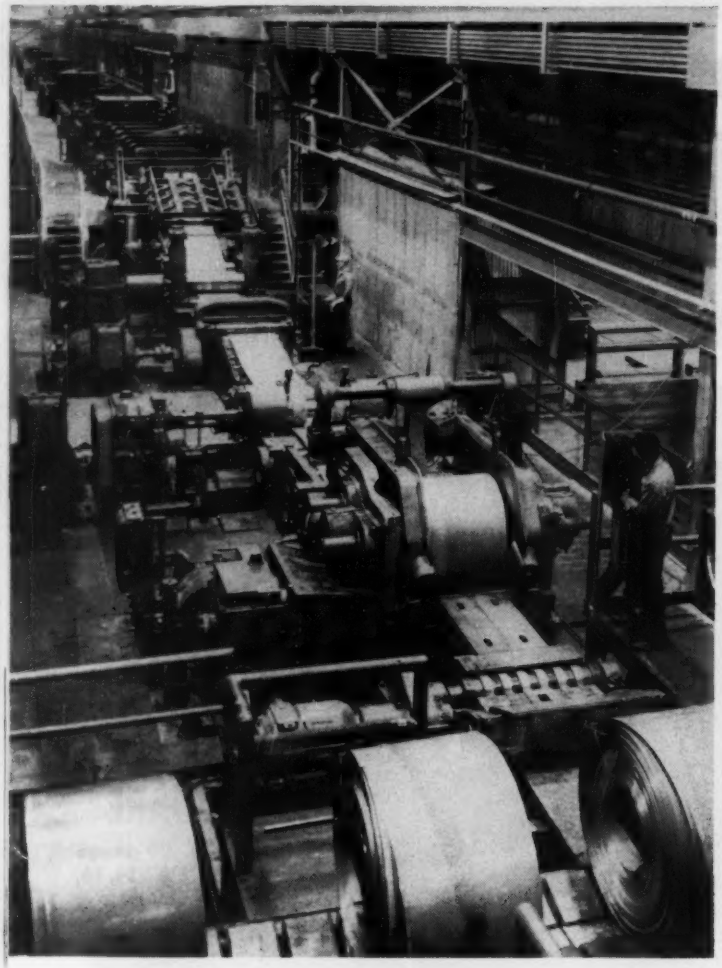


Fig. 28—Delivery end of a continuous pickling line for tin plate showing pickling tanks equipped with covers for fume removal, V-type air dryer, No. 3 pinch rolls, upcut shear, side trimmer, upcoiler, rewinding rolls and heavy duty coil conveyor. This modern line produces coils 6 feet in diameter weighing 30,000 pounds or more. Mesta Machine photo

very light reductions on oiled sheets.

A shearing line for processing sheets, which have been coiled after hot-rolling, consists of a feed-reel or a processor followed by a rotary side-trimmer and a flying shear, or in place of a flying shear, a roller leveler and an upcut shear equipped with a movable end-gage. Material 16 gage (0.059-inch) and lighter, can be uncoiled and cut to length from a cone-type feed reel while heavier gages must be decoiled by means of a processing unit which will hold the strip under tension and produce an infinite number of minute parallel cross breaks. The most popular machine of this type is the McKay processor illustrated herewith, Fig. 23.

The coil is supported upon a mandrel and the free end is entered into a double set of pinch-rolls after which a backed-up roll of small diameter is lowered upon the coil and the machine started in operation. Uniform pressure is maintained upon the small diameter roll, or breaker-roll as it is called, by means of an air or a hydraulic cylinder. Tension is created in the strip between the pinch-rolls and the breaker-roll, causing fine cross breaks to develop as it is pulled around these two different sets of rolls. These cross breaks are so fine that no detriment is done to the strip and a uniform structure is imparted to it as well as sufficient cold work to prevent cross breaking at other points in a processing line. It is sometimes necessary to skin-roll the front and back end-cuts from the coil in order to secure proper flatness. Bending of the strip around the breaker and pinch-rolls loocens mill oxide and greatly facilitates the pickling operation when performed. If sheets are not to be pickled, it may be desirable to pass them through a scrubbing and drying unit to remove the loosened oxide.

Continuous pickling of low carbon steel sheets and low carbon steel strip in coils is carried out on a processing line which may vary as to the number of units but which in its most advanced form consists of a decoiling device with leveler, an upcut shear, a flash welder, a flash trimmer, a stitcher, a set of pinch-rolls, a looping pit, a second set of pinch-rolls, either four or five pickling tanks, a combination cold water rinse and hot water drying tank, a hot air dryer, a third set of pinch-rolls, a second upcut shear, a slitter and a recoiler, usually of the upcoiler type, see Fig. 24.

The McKay processor, Fig. 23, has achieved almost universal application as a decoiling machine for continuous pickling lines. This is due to the increased pickling rate which may be maintained on account of the scale breaking effect of the processor and also the freedom afforded from cross breaks due to the cold-working of the strip. Recent machines have been equipped with an expanding mandrel and drag generator which eliminates the use of side guides while decoiling and the additonal back tension on the strip increases the scale breaking effect.

The first upcut shear is used to crop the front and back end of each coil after which the tail end of one coil and the leading end of the next one are joined either by a flash welder, Fig. 25, or by a stitcher. When welded together, the flash produced by upsetting during the welding operation is removed either by a plow-type or a draw-type flash trimmer. Excess metal at the weld may be removed to within a few thousandths of strip thickness or it may be undercut depending upon results obtained at the tandem mill when rolling the welds. The first set of pinch-rolls is used to pull the leading strip during the locking operation when making a stitch and to feed the strip into the looping pit, Fig. 26, as it is being decoiled by the processor. Speed of decoiling on a modern processor varies from 700 to 1500 feet per minute, depending upon the line width. The looping pit is used to store sufficient strip so that it is unnecessary to stop the flow of material through the pickling tanks during the feeding of a new coil into the processor and during the welding or stitching operation.

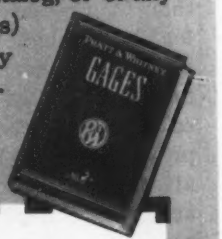
The second set of pinch-rolls, Fig. 26, feeds strip from the looping pit into the first acid tank which may range from 60 to 80 feet in length with a depth of about 4 feet and a width which should be at least 18 inches greater than the widest strip to be pickled. Tanks are of steel plate construction, lined with ¼-

All yours...

this "gold mine" of GAGING INFORMATION FROM Accuracy Headquarters

CATALOG NO. 11

contains the complete listing of P&W Gages and Gaging Equipment. To obtain a copy of Catalog, or of any individual Bulletin(s) illustrated, simply check the corresponding numbers in this coupon . . .



Pratt & Whitney

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT

Pratt & Whitney
13 Charter Oak Boulevard
West Hartford 1, Conn.

I'd like to have, without obligation, the P&W Gage literature checked below. Please send to

Name.....

Firm.....

Position.....

Address.....

City.....State.....

1....	4....	7....	10....	13....
2....	5....	8....	11....	14....
3....	6....	9....	12....	15....

Catalog No. 11....

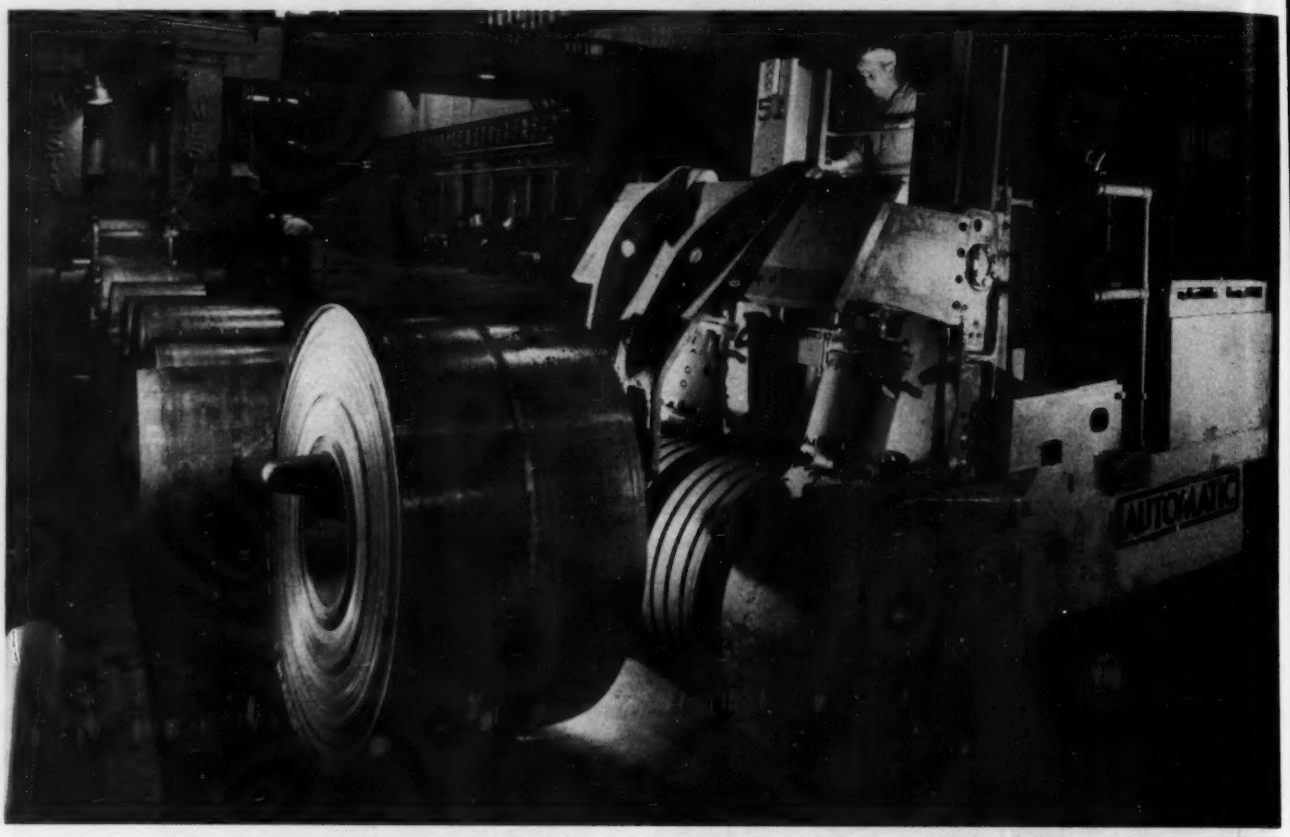


Fig. 29—Tractor of 30,000-pound capacity used to handle pickled coils on the entry side of the cold reducing mill. J. & L photo

inch of rubber which is protected by a 9-inch wall of acid proof brick laid in temperature-resistant acid proof cement. Rubber covered rolls are placed between each tank, from which the strip hangs in a catenary in the acid bath. In some installations, depressing-rolls of acid-resistant material are provided at each end of each tank to increase the amount of submergence of the strip while in the acid. Very efficient use of the acid is obtained by adding the entire amount of new acid to the last tank in the line, then by the cascade principle, permitting it to counterflow through the other tanks in opposition to the strip movement. The cascading effect may be obtained in one of the following ways: 1—By setting each tank a few inches higher in elevation than the preceding tank, the last tank being the highest with all tanks being connected. 2—By carrying a higher acid level in each tank, the last tank carrying the highest level with all tanks being connected. 3—By use of acid-resistant pumps to move partially spent acid from tank to tank.

The acid bath in the last tank consists of a 20-25 per cent solution of sulphuric acid at a temperature of 215° F. Acid content in the first tank will be about 10 per cent, and must be drained at such a rate that the iron content shall not exceed 6 to 7 per cent (20 per cent ferrous sulphate), otherwise acid content and temperature must be raised. Temperature of the acid tank and hot water tank is usually maintained by means of live steam issuing from jets within the baths. An inorganic inhibitor is used to prevent the acid from attacking the clean steel surface of the strip, thereby reducing the hazards of overpickling. There is also a slight reduction in total pickle loss which usually amounts to about 0.5 per cent on a modern high speed line.

The pickled strip carries some acid on its surface as it leaves the last acid tank and this is removed in the combination rinse and drying tank which consists of a tank similar in construction to the other tanks in the line but with a dividing partition and a rubber covered roll in its center. The first section contains cold water for removing any residual acid and iron sulphate while the next section is filled with hot water whose purpose is to elevate the strip temperature to a point where the hot air dryer, located immediately after this tank, will evaporate all moisture from its surface and produce a dry product.

The air dryer, Fig. 27, consists of a high-speed blower, a steam heating element, and a top and bottom dryer pipe. These pipes are usually shaped like the letter "V" with the apex pointed against the direction of strip travel. Slots are cut in the pipe sides nearest the pass line and the hot air passes through these orifices against the strip, evaporating its moisture.

Rubber-lined steel covers are provided for the acid and hot water tanks and also an exhauster system for removing acid fumes and steam. The third set of pinch-rolls pulls the strip through the acid and water tanks and governs speed of the pickle line. Proper synchronizing of the second and third sets of pinch-rolls governs the catenary loops in the pickling

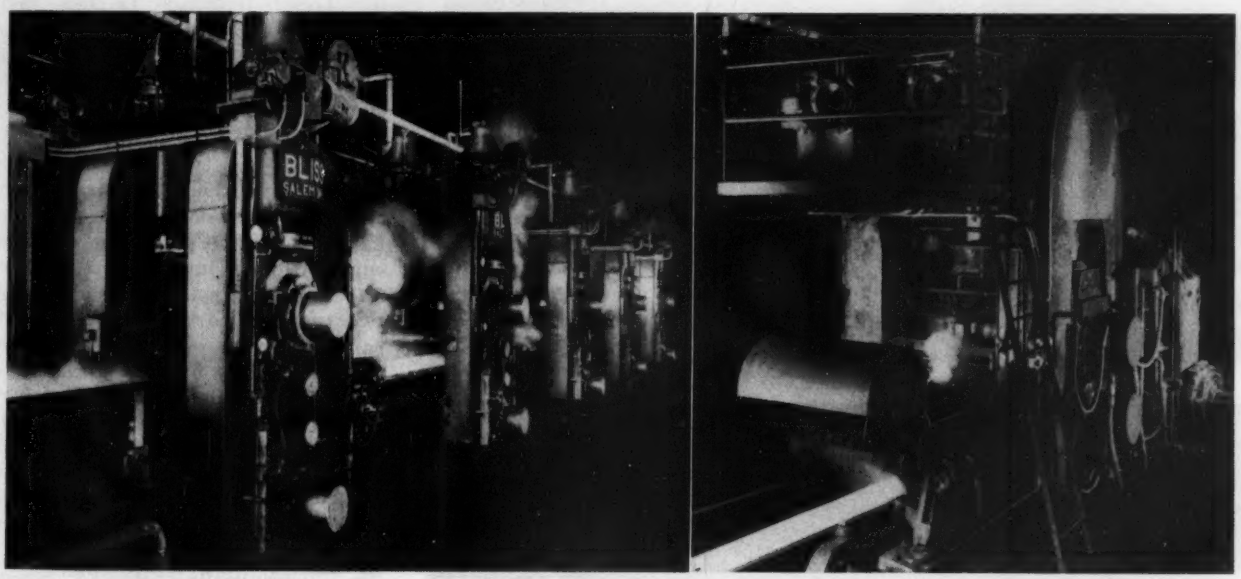
tank, hence the depth of immersion of the strip and to a great extent the rate at which the line may be operated successfully.

The second upcut shear is arranged to make two cuts in succession when once started, so that by slowing down the line speed and starting the shear in operation, a piece approximately 12 inches long can be cut out of the strip which will contain the stitch or the weld area. It is not necessary to completely stop strip flow through the line as the completed coil can be rapidly ejected from the upcoiler. The pickled coil may consist of a single hot-rolled coil or up to ten hot-rolled coils, weighing approximately 60,000 pounds. Pickled coils for cold reducing into tin plate on a modern high-speed tandem mill weigh about 30,000 pounds while coils for cold reducing into sheets may vary from 20,000 to 60,000 pounds depending upon plant equipment and width of coil.

There has been a tendency in recent years towards side trimming of coils for cold reducing into tin plate on high-speed tandem mills also for coils for cold reduced sheets which are to be annealed and skin-rolled in coils, after which they may be shipped to the customer in coils or cut to length before shipment. This also applies to cold-rolled sheets lighter than 22 gage (0.0299-inch). It has been found that the side trimming operation can be performed to best advantage on pickled material and for this reason a rotary side-trimmer is usually placed on all modern continuous pickling lines between the last upcut shear and upcoiler. This unit causes little if any loss in production on the pickle line and effects considerable economy in manpower and transportation costs as compared to those of a separate side trimming operation.

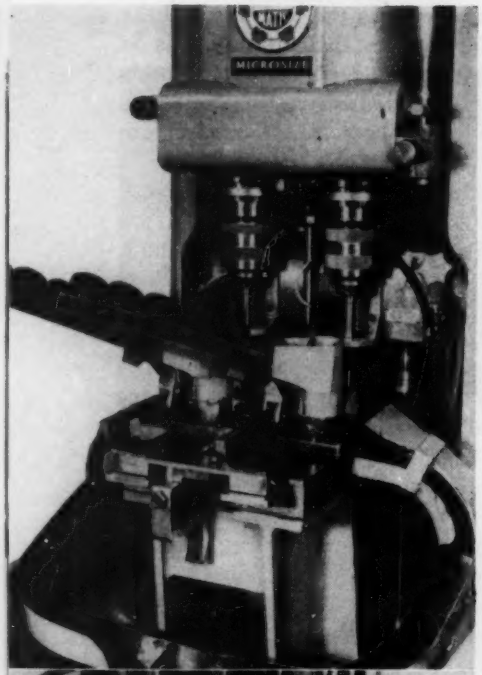
Continuous pickle lines such as described above, are designed to operate at speeds up to 450 feet per minute. However, a speed of 350 feet is usually about the top limit except for Bessemer steel which pickles very readily and requires lower temperatures, otherwise the strip may be completely pickled away should a delay occur on the line. Ward-Leonard control is usually furnished for the processor and number one pinch-rolls and a duplicate control for numbers two and three pinch-rolls, the rotary side trimmer and upcoiler. The metal can be removed from the acid bath by inserting a wooden wedge between the strip and the number two pinch-roll then starting up the number three pinch-rolls. When all of the slack has been removed from the catenary loop a wedge is inserted on the delivery side of this last set of pinch-rolls. This practice is followed when a delay of any length seems imminent and at completion of a schedule when the line will be idle for several turns. Production of 500 net tons per turn on cold-rolled sheets up to 72 inches wide and 600 net tons per turn on tin plate up to 32 inches wide is readily obtainable on the type equipment just described.

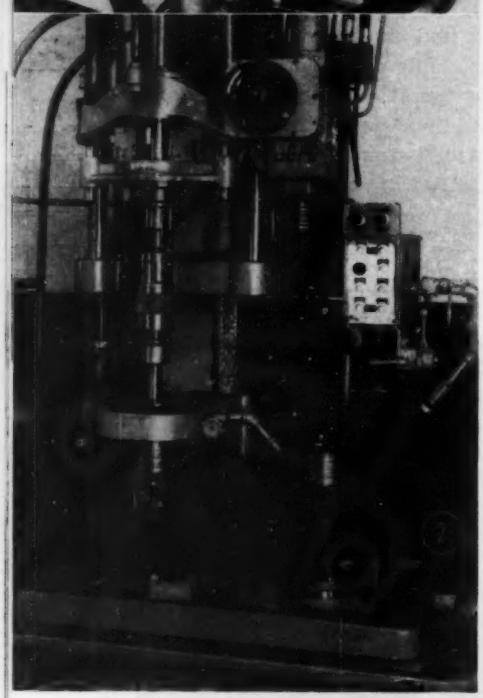
(To be continued)



NEW STEEL CAPACITY: Shown above are views of the roughing stand and five-stand finishing train of the new 24-inch continuous hot-strip mill recently installed at the Carnegie, Pa., plant of Superior Steel Corp. Roughing stand is run by a 2000-hp, 180-rpm, 2200-v synchronous motor. Vertical edging rolls are located on the entry side and are driven by a 300-hp, 600-v dc motor which is supplied by a 400-kw, 600-v generator driven by a 500-hp, 2300-v synchronous motor.

Tilting tables on each side of the mill manipulate slabs between passes. Finishing stands are located 128 feet, 6 inches from the roughing mill and stands which are arranged in tandem are placed on 15-foot centers. Oil flooded bearings are used on the back-up rolls and roller-type are used on all work rolls. All back-up rolls are 24⅞ inches in diameter with a 24-inch face length. Work rolls in first two finishing stands have 14-inch diameters and in the remaining stands have 12¾-inch diameters





AUTOMATIC OPERATION GREATER PRECISION

. . . . feature latest honing machines

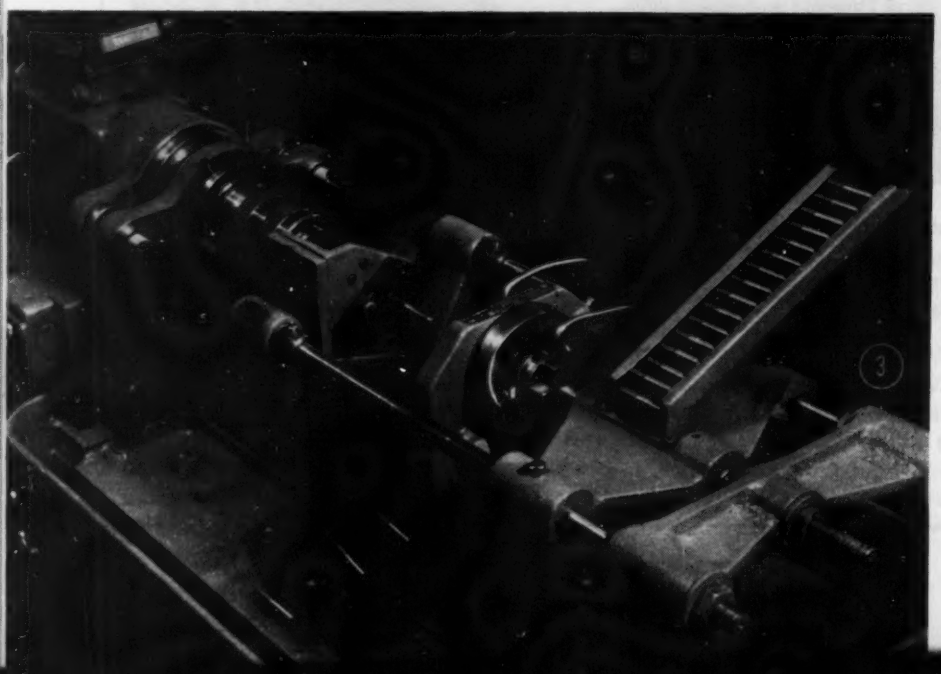
WHEN the bore is to size, the size control ends the machine cycle by collapsing the honing tool and withdrawing it from the bore. This is the entirely automatic operational procedure followed by an automatic, quill-type horizontal honing machine adapted to valve guide honing—one of several new machines introduced by Micromatic Hone Corp., Detroit, in a celebration commemorating its 20 years of development and building of a wide variety of honing machinery.

Executives and operating officials from metalworking plants throughout the country present at the mid-May display saw machines which featured automatic operation and which worked within tolerances measured in millionths of an inch. They also witnessed the presentation of a 25-minute film report on the generation of metallic bearing surfaces.

Fig. 1—Hardened gears are fed into magazine, dropped into position in fixture, bores honed and ejected at the rate of 300 pieces per hour on this double-spindle machine

Fig. 2—Diesel engine liners are held to a tolerance of 0.001-inch or less in honing setup in this Barnes machine

Fig. 3 — Automatic, quill-type horizontal machine adapted to honing valve guides. Parts are finished straight and round automatically



Production of the valve guide hone is around 250 pieces per hour, visiting officials were told. The unit, shown in Fig. 3, also holds the work to within 0.0003-inch on the diameter. To insure sufficient coolant flow to the surface being honed, the machine is equipped with an "intraflow" tool—coolant flowing through the inside of the tool and jetted onto the surface during the honing operation.

Automatic loading features the machine shown in Fig. 1. Hardened gears are fed into a magazine, from which they are dropped automatically into position in the fixture. Bores are honed and ejected by the double spindle unit at the rate of 300 pieces per hour. An electronic control holds the honed tolerance to less than 0.0003-inch. Taper and out-of-round is less than 0.0001-inch and the finish is said to be 12 microinches root-mean-square.

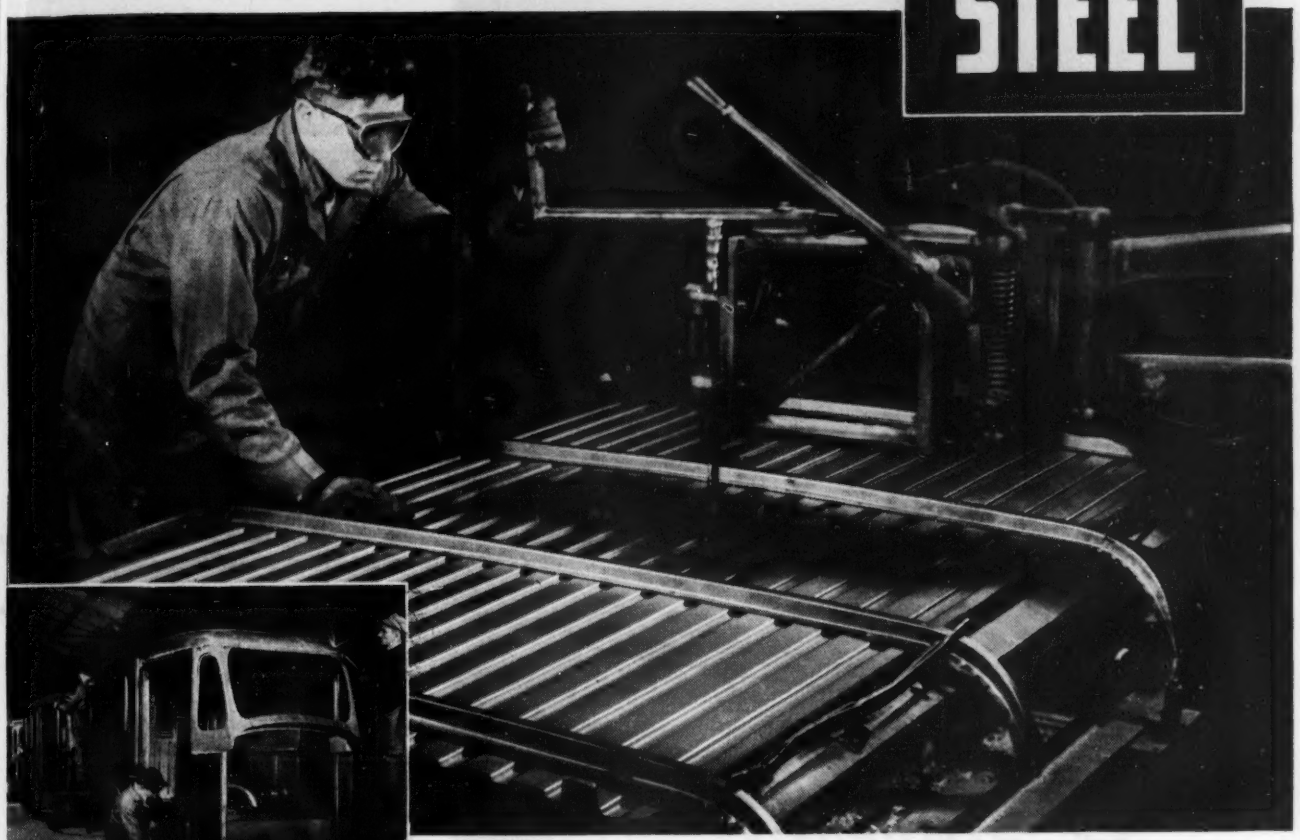
Rate of tool expansion may be adjusted for any type or hardness of material by the Micromatic head shown mounted on a Barnes machine in Fig. 2 for the processing of diesel engine cylinder liners. Bore of these 5.75 x 15-inch cylinders is gaged by two tungsten carbide bars diametrically opposite each other, held against the bore by light spring pressure. When honing tool is in a bore that is undersize, the contacts are held open; as stock is taken out of the bore, the contacts are brought closer together, meeting when the bore is to desired size. At this point a circuit is closed, ending the cycle. The hydraulically actuated honing head automatically compensates for stone wear as it expands and collapses the tool for each part. The 25 liners-per-hour production of this machine is said to hold size to less than 0.001-inch tolerance with a finish of 12 to 16 microinches rms and removing from 0.001 to 0.005-inch of stock.

Hand lapping operation, ordinarily used for such small diameter parts

(*Please turn to Page* 136)

Hughes-Keenan Corporation
Increases Truck Payloads 20% with J&L OTISCOLOY high-strength steel

J&L STEEL



(Above) *Spot-welding a truck roof-reinforcement and bow assembly, made of* J&L *Otiscoloy steel, at the Hughes-Keenan Corporation, Delaware, Ohio. Both the panel and bows are cold formed.* (Left) *Truck bodies on the Hughes-Keenan assembly line.*

Builds stronger, longer-lasting truck bodies with less steel

Eliminating 20% of the deadweight from milk truck bodies is not the only advantage in using J&L Otiscoloy high-strength steel, according to Hughes-Keenan Corporation, Delaware, Ohio.

For good sanitation, milk truck bodies must have their interiors steam-cleaned every day. Moisture from melting ice refrigeration during milk delivery is always present. Normally the continuous wetting and drying would cause rapid corrosion in a milk truck body made of mild steel.

Otiscoloy resists rust four to six times as effectively as mild steel. This pays off to the truck owner in longer service life. And it pays off to Hughes-Keenan Corporation in having a better quality, lighter, longer-lasting truck body.

The quality in these truck bodies does not entail added production costs. Although high-strength steel is more expensive than mild steel, Otiscoloy is used two gauges lighter with equal or greater strength than ordinary mild steel. Four sections can be made from Otiscoloy where only three sections of equivalent strength could be made from the same weight of mild steel. More units are produced per ton, freight costs are reduced, units are lighter, easier to handle during production.

Otiscoloy is recommended for applications where strength without bulky weight is desired—also where corrosion, abrasion and fatigue are problems in the service life of equipment.

Otiscoloy can be formed hot or cold, welded, forged, flame-cut and otherwise worked by standard methods. Here is a *modern* steel that is worth *your* investigation. Why not return the coupon to us today?

Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me at once a copy of your booklet, "Otiscoloy High-Tensile Steel."

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L *manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY (*hi-tensile steels*).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Fig. 1 — Operator checking compressed air and steam consumption from integrating recording flow meters. Accurate cost accounting contributes to cost reductions

Engineered Instrumentation

Makes Quality Control of Tin Plate Production Effective

By HARRY C. MORROW
Meter and Instrument Foreman
Carnegie-Illinois Steel Corp.
Gary, Ind.

TIN PLATE is one of the staple commodities of the vast steel industry. Since it is used primarily in the manufacture of containers for foods and other products of a perishable nature, it is essential that tin plate be of high quality. Attainment of this high quality depends upon accurate and vigilant control of materials and processes throughout the entire operation from the original starting material of steel slabs to the finished sheet of tin plate. Much of the responsibility for the control of the processes rests with automatic instruments such as pyrometers, thermometers, flow and liquid level meters, pressure gages and solution concentration controllers.

At the Gary sheet and tin mill extensive instrumentation is involved in annealing of coiled strip, hot dip tin plating and electrolytic tin plating. In addition, instruments are widely used in this mill for purposes of cost accounting of utilities such as steam, compressed air, electricity, fuel and water. Following are the highlights of this instrumentation.

In the annealing process or cycle there are three distinct operations, namely, loading the bases, heating and cooling. Since the furnace is required only during the heating portion of the cycle, only one furnace, which can be moved from base to base, is required for each three bases. In this plant a total of 52 gas fired portable annealing furnaces are used in conjunction with 156 bases and the furnaces, with automatic temperature control, are designed to fit over any of the bases so that continuous production is assured. Instrumentation also is only needed for the heating operation, therefore, for each three bases an automatic control station and instrument panel is installed.

Varying with the type of tin plate produced, different schedules for heating the steel to annealing temperature, for "soaking" at that temperature, and for cooling are required. The average charge of steel is usually made up of four stacks of coils, each three or four coils high. Coils are covered with a light steel inner cover and the rectangular refractory lined portable furnace is then placed over the group of four stacks on a single annealing base. At the end of the heating and soaking period, the portable furnace is removed, but the light sheet steel inner cover containing an inert atmosphere to protect the steel surface cannot be removed until the steel has dropped to 300° F or lower because oxidation and scaling result at higher temperatures. DX or NX gas generators supply atmosphere gas which is piped into each base when it is covered. The protective gas is maintained at a slightly positive pressure to prevent possible infiltration of the outside atmosphere. On several furnaces there are eight inspirating gas burners spaced along each side with two burners at each end making a total of 20 burners per furnace. On other furnaces there are 20 burners on either side or a total of 40 burners.

Iron-constantan thermocouples with beaded ceramic insulators are placed as follows: One "work" couple is located in each bottom steel coil of

the four stacks, one couple is inserted in the third or fourth wrap of the center of the coil or about 1-inch in from the center wrap of one of the coils on top of the stacks, and the heating control couple is located in the combustion zone between the furnace and inner cover. This location is selected to reduce measuring lag and to prevent furnace damage.

The heating control couple is connected to a circular chart electronic type potentiometer calibrated from 0 to 2000° F. This instrument is equipped with pneumatic proportioning control and a control by-pass panel used for switching from manual to automatic control and vice versa. Pneumatic control which is relatively new for this application has proved quite successful. A throttling range of about 3 per cent has been found satisfactory and the usual set-point for this couple during the annealing period is 1500° F.

The other couples are connected to a six-point electronic recorder calibrated from 0 to 2000° F. The heating control couple is also connected to this recorder for checking purposes. To simplify connection of work thermocouples to the extension wire which leads to the recording instrument, the extension wire is permanently installed in a conduit, the latter being equipped with connectors designed especially for this application. Such connections can be made easily and quickly and the design practically eliminates extension wire damage. Fuel to the burner manifold is modulated according to demand through an adjustable port valve equipped with a pneumatic operating mechanism and valve positioner actuated by the circular chart potentiometer. Stabilized petroleum gas mixed with air to contain a constant Btu value is currently used for fuel with orifice restrictions placed in the burner supply lines to assure uniform fuel pressure at each burner. So that each control station can accommodate three bases, flexible connections are used between the controlled fuel supply pipe and the cover being heated. Also located on each control panel are small gages which indicate fuel line pressure and fuel pressure down stream from the control valve. A small fuel by-pass along with the control valve assures that the burners will remain lit at all times during the firing period and thus, safe and immediate combustion will take place whenever the instrument calls for fuel. A manual shut-off valve for safety protection is placed in each fuel supply pipe.

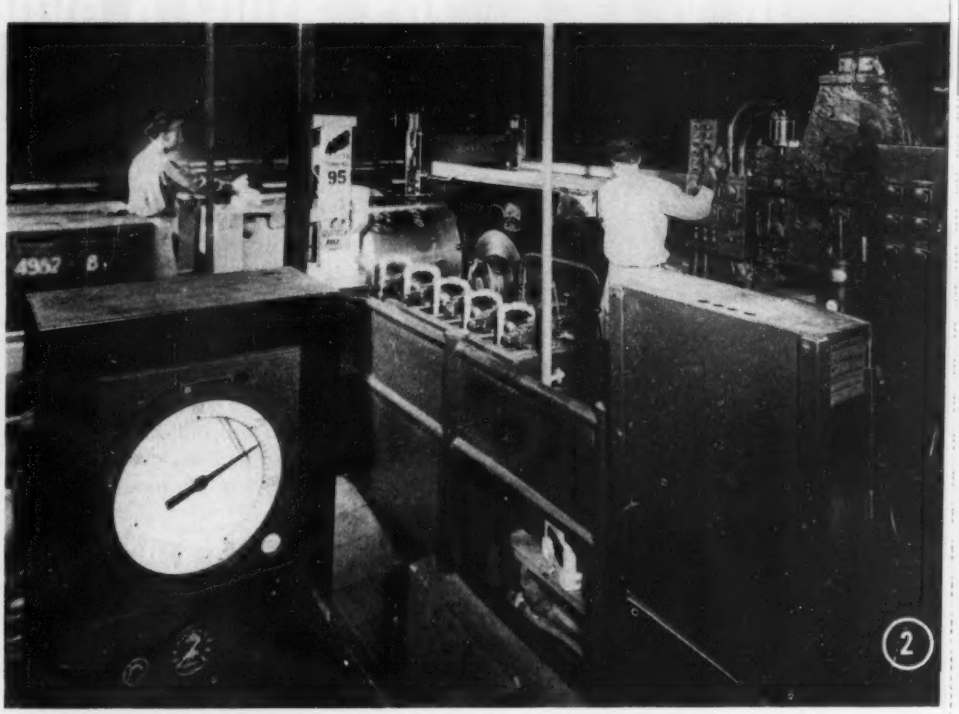
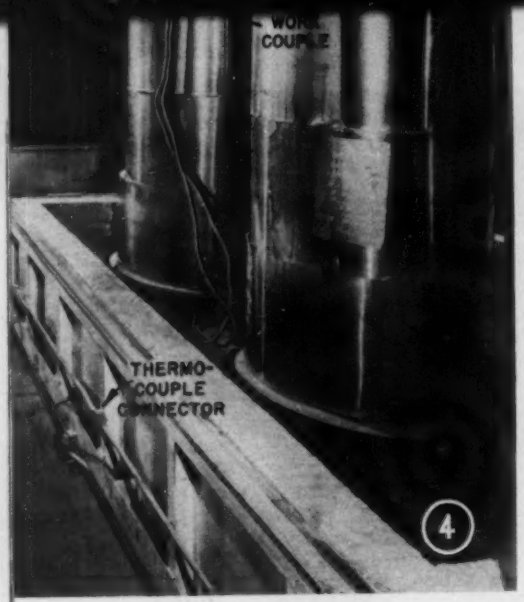


Fig. 2—Circular chart electronic pyrometer controlling temperature of alkaline cleaning solution in continuous electrolytic tin plating line. All illustrations courtesy Brown Instruments Division of Minneapolis-Honeywell Regulator Co., Philadelphia

The importance of precise temperature control throughout the annealing cycle can be appreciated when it is realized that annealing temperature and time largely determine the physical properties of tin plate of any specified chemical composition. As most tin plate is manufactured into cans on very high-speed automatic equipment, it must be supplied to narrow ranges of physical properties

Fig. 3—Battery of electronic pyrometers which control molten tin metal and palm oil temperatures in series of hot dip tinning pots



which in turn require strict adherence to the optimum annealing temperature.

Timing of the soaking period is not begun until all work couples reach a predetermined temperature. This timing is done manually but chart records attest to the accuracy with which the task is handled.

Molten tin metal through which steel sheets are passed in hot dip tinning is contained in gas fired pots and covering the molten tin surface at the discharge end of each pot is a deep layer of palm oil. Temperatures of both tin and palm oil, maintained at different set points, are important factors in the process control.

Tin bath temperature is measured by an iron-constantan couple which is protected in a closed-in length of 7/16-inch low carbon seamless steel tubing with a 1/16-inch wall thickness. The electronic pyrometer to which this couple is connected controls the temperature by modulating the supply of premixed fuel to the burner, which is located in the pot, through an electric-motorized proportioning valve. Should the metal temperature become too cool, the process would be unworkable whereas too high a metal temperature would cause oxidation and discoloration of the tin plate.

Palm oil layer on top of the molten tin bath protects the hot tin coating from blemishes as the sheets are passed on by pinch rolls; it also excludes air from the tin surface and so prevents oxidation of the tin coating while the sheet is cooling. Palm oil temperature is measured by an iron-constantan couple which is protected in a closed-in length of 5/16-inch low carbon seamless steel tubing with a 1/32-inch wall thickness. This temperature is controlled by an indicating-recording electronic pyrometer equipped with a mercury switch which turns a circulating pump on or off. This pump circulates oil from the pot through a water-cooled heat exchanger. Should the palm oil drop below the proper temperature, tin plate quality would be immediately affected since an unequal distribution of the tin coating would result. On the other hand, too high an oil temperature causes discoloration of tin plate and might even lead to ignition of the oil.

Coils of annealed and temper rolled strip are continuously uncoiled and passed in one unbroken length from one operation to the next in the electrolytic tin plating process, emerging at the exit end of the line either in the form of coils of tin plate or sheared sheets of tin plate. We have three continuous electroplating lines and the instrumentation is substantially the same on all three lines. In addition to the instruments hereafter described, there are scores of meters

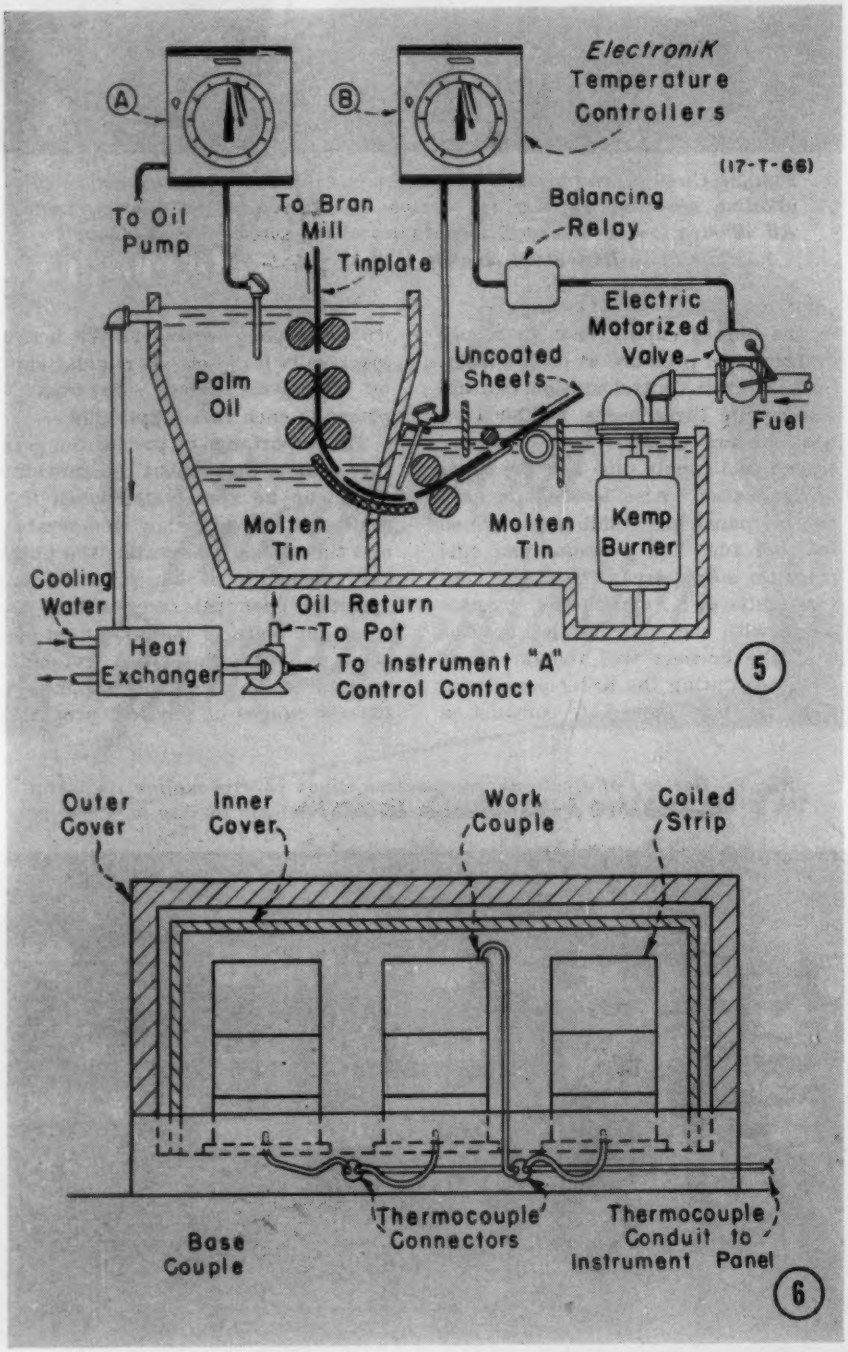


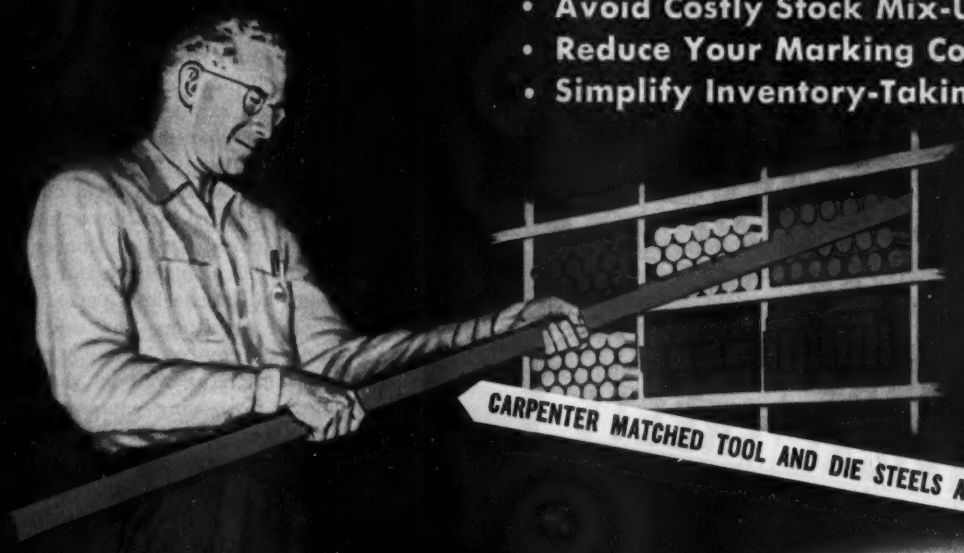
Fig. 4—Base with cover removed. Work couple located in top coil and thermocouple connectors along side of base are clearly shown

Fig. 5—Control system for typical hot dip tinning pot

Fig. 6—Arrangement of thermocouples in coiled strip annealing installation

Now . . . You Have a Quick, Positive Way to . . .

- Identify Tool Steels in Stock !
- Avoid Costly Stock Mix-Ups !
- Reduce Your Marking Costs !
- Simplify Inventory-Taking !



CARPENTER MATCHED TOOL AND DIE STEELS ARE NOW PAINTED FULL LENGTH !

Today Your Tool Steel Dollar Goes Further When You Use Carpenter Matched Tool & Die Steels !

In addition to the many advantages you get with full length painting of tool steel bars, the Carpenter *Matched Set Method* gives you . . .

Easier Tool Steel Selection!
Simplified Heat Treatment!
Lower Tool Steel Inventories!
Less Machine Down-Time!
Higher Output Per Tool and Die!

Dollar for dollar, you get far more value when your orders specify Carpenter Matched Tool and Die Steels. Start now to cash-in on these exclusive, cost-reducing benefits . . . call your Carpenter Warehouse or Distributor for fast shipment, today.

THE CARPENTER STEEL COMPANY, 139 W. BERN ST., READING, PA

Carpenter

MATCHED

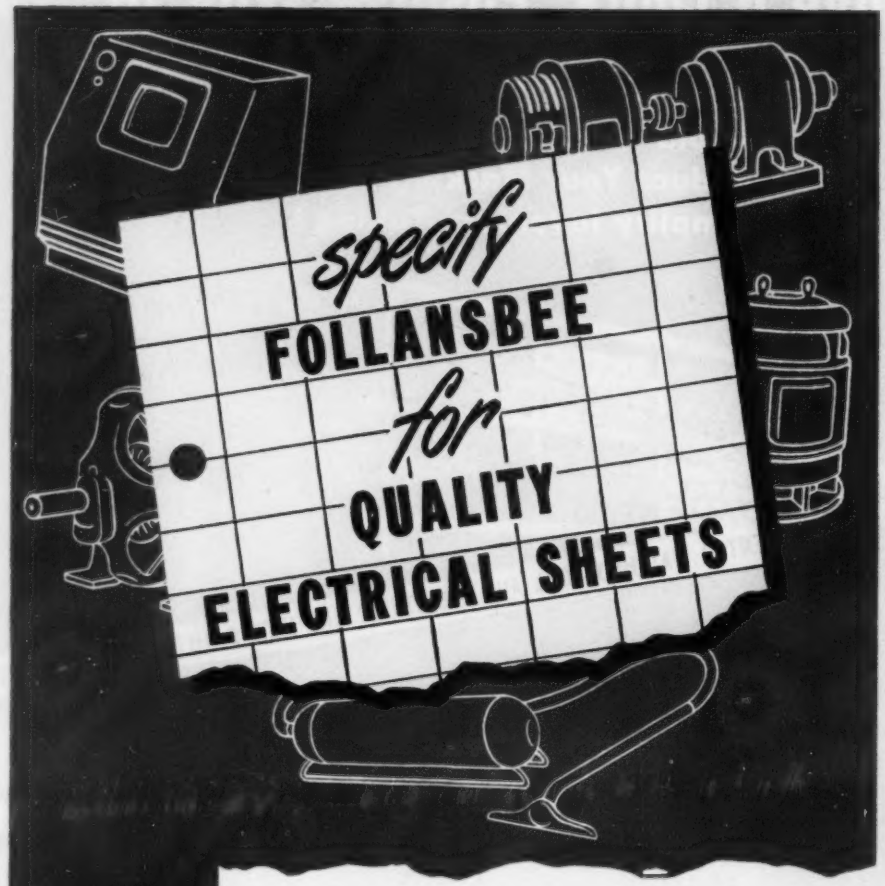
TOOL & DIE STEELS

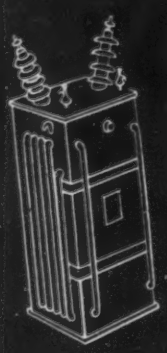
Printed in 12 colors, this 21" x 30" Tool Steel Selector Wall Chart identifies each Carpenter Matched Tool and Die Steel. Write for your copy, now.

***Painted* Bars in Stock -- Immediate Delivery !**

Atlanta	Buffalo	Detroit	Kansas City	St. Louis
Baltimore	Chicago	Grand Rapids, Mich.	Los Angeles	Worcester, Mass.
Birmingham, Ala.	Cincinnati	Hartford	New York	In Canada:
Boston	Cleveland	Houston	Philadelphia	Toronto
Bridgeport, Conn.	Dayton	Indianapolis	Providence	Montreal

Export Department, 233 Broadway, New York 7, N. Y. "CARSTEELCO"





There's a Follansbee Electrical Sheet with the proper physical and electrical characteristics for any design requirement.

When you specify Follansbee you can be sure of silicon steel suitable for use in the manufacture of your high quality electrical machinery. Follansbee Electrical Sheets are now available for use in your products.

You'll be interested to know about the working qualities of Follansbee Electrical Sheets, too. The Follansbee Representative will assist you in selecting the correct grade for your specific requirements.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS
SEAMLESS TERNE ROLL ROOFING

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va., and Toronto, Ohio.

Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

which indicate various voltages and amperages as well as several indicating and recording tachometers.

As a first step in electroplating, the steel strip is cleaned. This is accomplished by passing it through an electrolytic cleaning tank containing an alkaline solution. The solution is made up and stored in large tanks located in the basement of the line and is continuously pumped to the cleaning tank with the level control being accomplished by an overflow return to the storage tank. Concentration of active chemicals in the cleaning solution is checked periodically by manual titrations and additions are made as required. Quality of the cleaning action as well as the long life of the processing equipment are dependent upon close temperature control. Cleaning solution temperature is measured by an iron-constantan couple protected by a closed-in steel tube electrically insulated from the tank. This couple is connected to a circular chart, indicating, recording electronic pyrometer equipped with pneumatic control. As the cleaning solution is continuously circulated from the tank through a water jacket heat exchanger and returned to the tank, the pyrometer control throttles the supply of cooling water to the jacket through a pneumatically operated diaphragm motor valve in accordance with the dictates of the couple.

After leaving the cleaning tank, strip is rinsed of cleaning chemicals in a water tank for which the only required instrumentation is a float type liquid level control. Following cleaning, the strip is pickled in sulphuric acid in order to condition the steel surface for the purpose of establishing a firm bond between steel and tin. Temperature control of the pickling tank is similar to the instrumentation in the cleaning tank mentioned above.

Plating of steel strip with tin is a prime concern in this method of producing tin plate and quality of the plate obtained is critically affected by the temperature maintained in the plating tank.

Depending upon weight of coating desired, the plating tank temperature will be established at a point between 100 and 125° F. Control is required since there is considerable dissipation of electrical energy in the plating tanks which tends to raise solution temperature. This temperature is controlled by a potentiometer which modulates the flow of cooling water to the jacket through which the plating solution is circulated. Plating

solution level is controlled by an overflow which returns the continually circulated liquor to a storage tank that is located in the basement of the line.

In passing through the electroplating tanks the strip is coated with tin which due to the nature of the process has a frosted appearance. In order to produce a smooth, highly reflective tin coating, the plated strip is passed through a melting unit which melts and "flows" the tin coating. In this operation, the strip between two conductor rolls acts as an electrical resistor and sufficient electric current is continuously applied to heat the strip to just above the melting point of tin. Melting current is controlled by the strip speed. Upon leaving the melting unit, strip passes through a water quench tank which is equipped with an overflow for level control. Quench water temperature is maintained by a circular chart electronic potentiometer pneumatic controller calibrated from 0 to 300° F which throttles the supply of cooling water to sprays.

After melting and quenching, the sheet passes to a treating unit where a solution is sprayed on to the sheet to condition the surface. Temperature control of these sprays is important and is effected in a similar manner to the system used for controlling temperature in the plating tank with the exception that in this instance steam is used to maintain the desired temperature rather than cooling water. Normally when heating a solution in an exchanger utilizing steam as a source of heat, the temperature controller directly throttles the supply of steam; however, in this line where such exchangers are used, the temperature controller throttles the removal of condensate thus, not only is heat extracted from the steam but also from the condensate, resulting in lower steam consumption.

Inspection Is Final Operation

Final operation in the electrolytic tinning process is inspection, which is accomplished in part automatically by photo-electric and micrometering devices and in part by an inspector, who continuously observes the moving sheet. The tin plated strip is then either coiled or sheared to exact length while moving and stacked automatically.

Such utilities as steam, gas, and compressed air are used in tremendous quantities in a tin plate mill and it is considered essential that consumption of each of these items be continuously recorded. Hence, instrument charts are checked at least once each day and all deviations from predetermined normal consumptions investigated. Such discrepancies are not only costly in terms of actual waste of the utilities, but have been found in many instances to be symptomatic of difficulties in the operations for which the utilities are furnished.

Sponge Iron Production Report Available

Foreign and domestic methods for producing sponge iron by the gaseous reduction of iron ore are described in a Bureau of Mines report of investigations covering tested processes or those proposed within the last 100 years. Shaft furnaces, the pipe most frequently used in making sponge iron are discussed, along with experiments with a rotary kiln, a multiple-hearth furnace, and a retort furnace. Carbon monoxide and hydrogen are the reducing gases most commonly used. Copies of the publication, report of investigation 4402, may be obtained free of charge by writing to the Bureau of Mines, Pittsburgh 13, Pa.

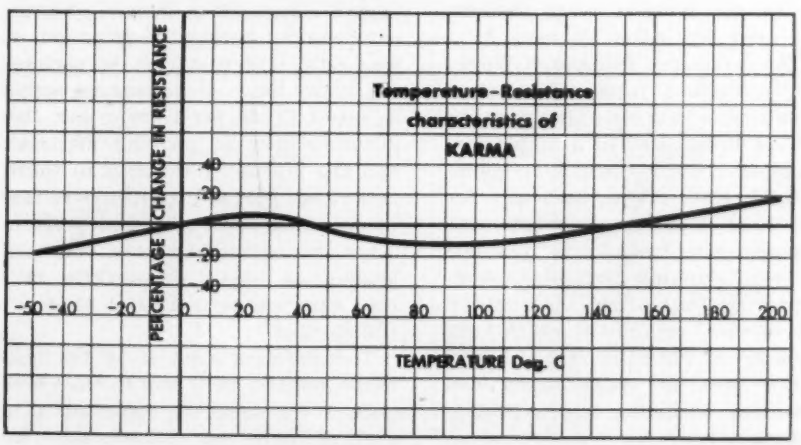
New Alloy Possesses

HIGH ELECTRICAL RESISTIVITY

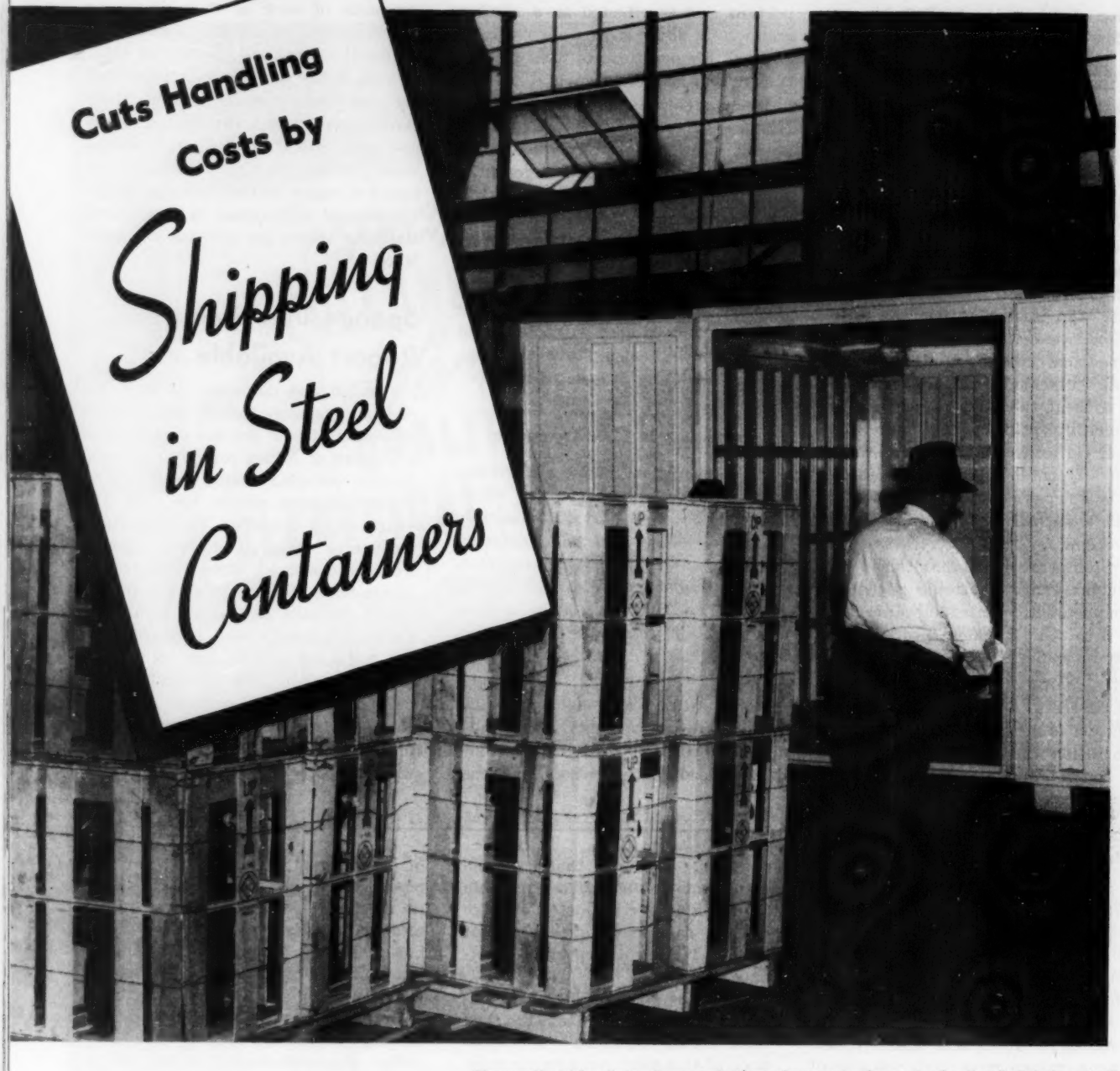
ABILITY to retain stable resistance values over wide ranges of temperature and unusually high electrical resistivity are properties which are said make a newly developed alloy specially suitable for high accuracy wire-wound resistors. Developed by Driver-Harris Co. of Harrison, N. J., the alloy, called Karma, has a specific resistance at 20° C of 800 ohms per circular mil foot.

According to its manufacturer, such high ohmage not only makes possible small resistors, with resultant savings in space and weight, but affords the manufacturer the advantage of more ohms per production dollar. In the making of potentiometers and resistance units used in radio, radar and other electrical equipment, there is a limiting minimum size, due to the lack of mechanical strength. It is said that with the use of this new alloy, it is possible to use a larger diameter of wire for the same resistance per foot due to its higher specific resistance.

It can be observed from the accompanying graph that the low temperature coefficient of resistance of this alloy remains constant over a wide temperature range. The wide useful range permits its use in precision resistors that are subjected to extreme changes in temperature, such as units used in laboratory research and airplane equipment. In addition to its electrical properties, the metal affords physical advantages. It has a tensile strength, at room temperature, of 130,000 to 180,000 psi. This higher tensile strength permits faster winding speeds. Having a low thermal expansion value—its coefficient of linear expansion is 0.000014/°C between 20 and 500° C—windings employing this new alloy are said to be less likely affected by distortion or movement.



Cuts Handling Costs by Shipping in Steel Containers



Domestic wire-bound crated transformers about to be loaded into steel container. Twenty-four of these can be stowed in a single unit

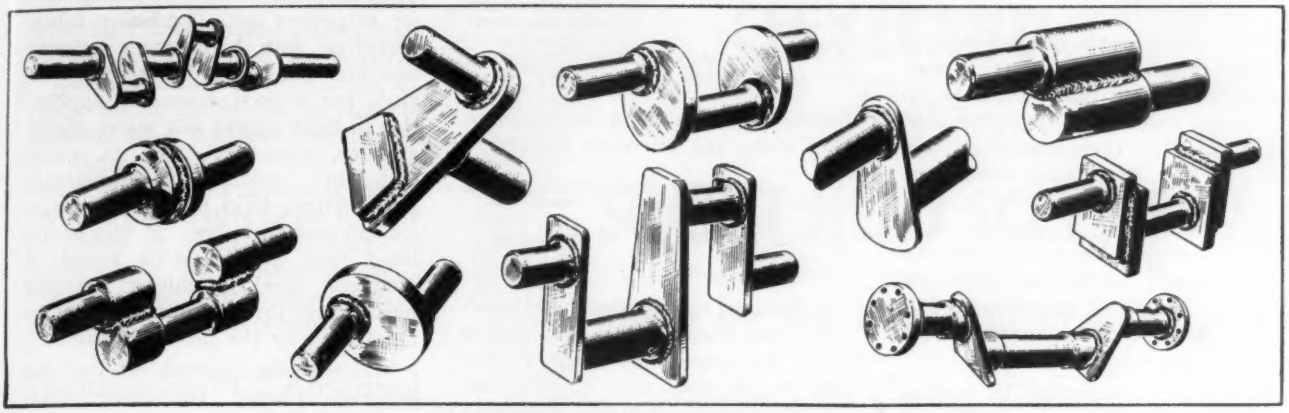
A METHOD whereby it can safely ship its products to foreign ports and, at the same time, reduce export packaging and loading costs by more than 66 per cent, is being successfully used by Allis-Chalmers Mfg. Co. The company's Pittsburgh Works recently shipped forty-eight 5 kva transformers to Puerto Rico, where they are being used in a rural electrification project. Packed in standard lightweight crates, used only for short haul domestic shipments, the equipment was loaded into weathertight steel shipping containers manufactured by Dravo Corp., Pittsburgh. Each of these containers, which have a capacity of 275 cubic feet or 12,000 pounds, held 24 transformers and accessories, including iron mounting brackets.

Previous means of shipment would have called for each of the 48 transformers to be packed in heavy wood export cases which require individual handling during the shipment. It was estimated that cost of packaging, under those circumstances, would be about $11.35 per transformer, this including cost of packing materials and the manhours required to fabricate cases, load the transformers into them, mark each case and perform other miscellaneous work. Cost of loading 48 export cases into railroad cars was estimated at $1.56 per transformer.

Transformers shipped by the container method were said to have been packed for domestic shipment at a cost of $2.86 per transformer, including materials and labor. Cost of loading the shipping containers with the 48 transformers was only $1.52 per transformer, 4 cents apiece less than the handling cost for loading 48 export cases into railroad cars. A further saving was that no time had to be spent for marking the 48 crates individually, as is necessary with export cases.

Allis-Chalmers reported that the total cost of packaging and loading the transformers for export shipment in accordance with standard methods previously employed amounted to $12.91 per transformer. Cost of the same operations when containers were used is said to have totalled $4.38 per transformer. Equipment was also protected from damage and pilferage by the container.

How Stronger Cranks Are Built at Lower Cost with Arc Welding



Examples of cranks and crankshafts fabricated from steel at lower cost with arc welding.

Many machinery parts like these simple cranks are being fabricated from standard steel shapes, eliminating the need for forgings or castings. Shaft components for the cranks may be produced from bar stock, machined to form as simple lathe operations, and throw members flame-cut from steel plate. Component parts are tack welded first or are located in simple fixtures for welded assembly using electrodes suited to the type of steel used.

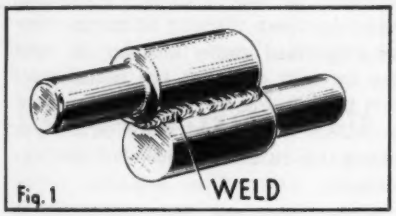


Fig. 1

Simplest of all cranks is shown in Fig. 1. Where accuracy of throw is unimportant, bars having a diameter equal to the throw can be fillet welded. If a longer crank throw must be maintained, the shafts can be fillet welded to a disc (Fig. 2) or two studs machined as shown in the lower sketch (Fig. 2) can be positioned back to back and the flanges fillet welded.

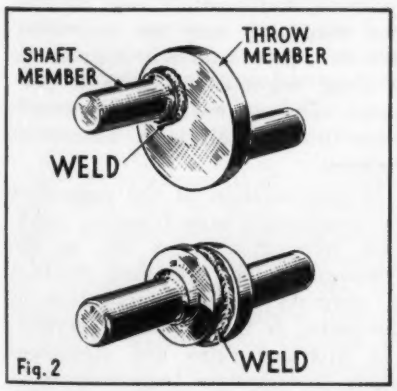


Fig. 2

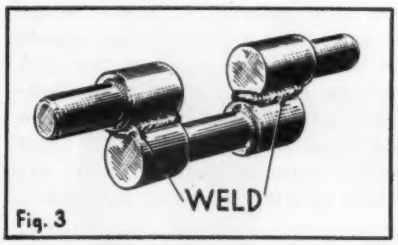


Fig. 3

Fig. 3 shows the elements of a single-throw crankshaft. On applications where the throw of the crank exceeds the diameter of the shaft members, discs cut from bar stock or flame-cut from steel plate are incorporated (Fig. 4).

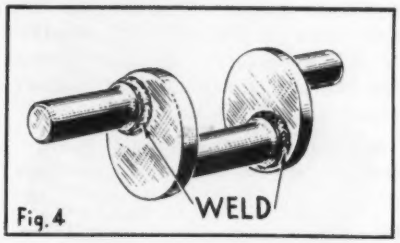


Fig. 4

To simplify the welded assembly of a crankshaft, the throw members can be built from rectangular stock and fillet welded as shown in Fig. 5, after which a trim cut may be taken on a lathe for appearance or balance.

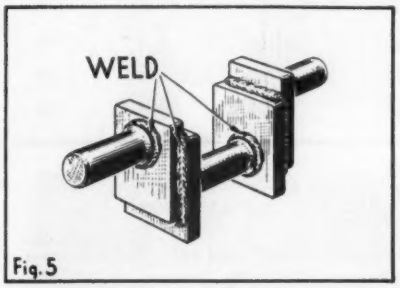


Fig. 5

Multiple throw crankshafts, as illustrated in Fig. 6, can be weld-fabricated to suit any requirements of size and throw. If necessary, different alloys can be incorporated in various component members to best suit the needs of the crankshaft. After welded assembly, the crankshaft can be

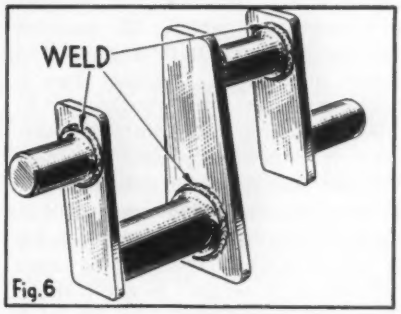


Fig. 6

machined all over in the conventional manner, accurately holding any size and throw specified.

Counterbalancing is easily accomplished by fillet welding weights to throw members as indicated in Fig. 7. Small deposits of weld metal can be added to any part of the crankshaft if unusually accurate balancing must be attained.

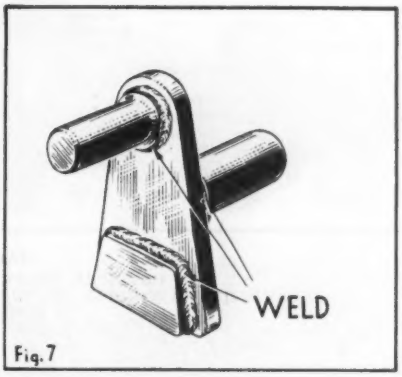


Fig. 7

The above is published by **THE LINCOLN ELECTRIC COMPANY** *in the interests of progress.*
Machine Design Studies are available to engineers and designers. Write on your letterhead to The Lincoln Electric Company, Dept. 67, Cleveland 1, Ohio.

Developments in Titanium—*Continued from Page 104*

about 100,000 psi which is only slightly less than the yield strength obtained through 50 or 60 per cent cold work. Moderate cold working by commercial forming processes will result in considerable increase in the strength. On the other hand, it was brought out that small amounts of cold work reduce the ductility considerably. This is indicated by the curve in Fig. 5 showing elongation in a 2-inch gage length plotted against cold work. It can be seen that this curve drops very rapidly and is nearly horizontal after 20 per cent cold work is attained. At 50 per cent cold work titanium still shows 12 per cent elongation.

The tensile properties of forged titanium bar over a considerable range of temperatures are shown in Fig. 6, presented by Bradford before the symposium. In this figure, ultimate tensile strength, 0.2 per cent yield strength, and Young's modulus are plotted against temperature. It was brought out that these data represent short-time tensile test results where the specimen is held at temperature about 30 minutes prior to testing. Referring to the curves in Fig. 6, titanium has a usable strength up through 800° F. This, according to Bradford, compares very favorably with the best aluminum alloys which ordinarily are not used to any extent over 400° F. Young's modulus for titanium holds up well to 800° F. It should be noted that this is important in applications involving elastic stability at high temperature. The subzero strength and modulus are high.

Rivet shear data on titanium with comparative values for 75S-T and 24S-T aluminum, as summarized by Bradford, are given below:

Material	Ultimate Shear Strength (⅛" Dia. Rivet)
Titanium	82,000 psi
75S-T aluminum alloy	47,000 psi
24S-T aluminum alloy	41,000 psi

Bearing strength tests on titanium sheet show the following results:

Material	0.5% Offset Yield Strength—psi	Ultimate Bearing Stress—psi
Annealed sheet titanium	117,000 psi	177,000 psi
25% cold worked titanium	170,000 psi	216,000 psi

According to Bradford, commercially pure titanium is readily forged within the temperature range of 1600-1800° F. It was also brought out that the machinability of titanium appears similar to that of austenitic stainless steels, and in such operations it is generally advisable to use the same tool angles, cutting speeds and feeds as are required for 18-8 stainless steel. Bradford also indicated that experiments have shown that titanium can be readily spot welded, seam welded, and inert arc welded to other pieces of titanium.

Concerning corrosion resistance of titanium, Bradford stated that samples of Remington Arms Co. titanium have been exposed to tests at Kure Beach, N. C. for periods up to 4 months which indicate that the metal has a high order of resistance to attack marine conditions, in the same class as platinum and Hastelloy C. Laboratory tests on titanium also indicate resistance to a number of corrosive chemicals.

Applications of Titanium Metal—Further data on corrosion tests were reported at the naval symposium by W. Lee Williams, U. S. Naval Engineering Experimental Station, as a part of work carried out to determine the applications of titanium. According to Williams, the outstanding salt water corrosion resistance of titanium offers numerous possibilities for shipboard use. Condenser tubes, operating with high water velocity was one example cited. Likewise, titanium has a good chance of application in light weight salt water piping systems, especially those in which turbulent conditions downstream from fittings have been causing premature erosion failure. It was postulated that troubles with Monel or stainless steel plumbing fixtures particularly through pitting might be eliminated by the use of titanium.

Williams also pointed out that the superior pitting resistance under packing conditions would indicate that titanium may well serve in pump rods or rotor shafts where stainless steel leaves much to be desired. Interest is high in the application to water lubricated bearings. The possibility of using titanium hardened by oxidation in developing high load-capacity, antifriction bearings for operation in salt water is being investigated. Experiments are also underway to determine the resistance to stack gases, with the object in mind of using titanium wire for shipboard radio aerials. It was also brought out that the metal may even be suitable for small, high speed propellers if the hydraulic cavitation resistance turns out as well as expected.

With reference to applications based on the general properites of titanium, Williams emphasized the following facts: In competition with stainless steels, light weight can be an outstanding advantage; in competition with the light metals, corrosion resistance stands out; against structural steels, corrosion resistance, lightness, and possibly ease of surface hardening may be controlling factors. Thus titanium appears to be most important because it possesses some of nearly all desirable properties, and all in a noncritical material.

In consideration of the properties of commercially pure titanium, Bradford, Remington Arms Co., in the symposium paper previously referred to suggests possible application of the metal in the following services: (1) Airframe skins and structures where intermediate temperatures or corrosion problems are encountered; (2) aircraft power plants where temperatures between 300° and 800°F are involved; (3) naval or marine ap-

TABLE I
MECHANICAL PROPERTIES OF TITANIUM PRODUCED BY TWO METHODS OF CONSOLIDATING TITANIUM POWDER

Condition	Tensile Strength, Psi.	Yield Strength (0.2% Offset) Psi.	Proportional Limit (0.01% Offset) Psi.	Elongation % in 2 In.	Hardness Rockwell G
1. Green compacts sheath rolled at 1475° F.	97,600	75,000	58,000	15.1	81
2. Standard compacts sintered, cold rolled, and annealed at 1475° F.	79,100	64,000	58,800	24.7	76
3. Same as 1, plus 40% cold reduction	129,400	111,500	75,600	2.6	94
4. Same as 2, plus 40% cold reduction	122,200	113,300	84,400	7.5	91

TABLE II
PHYSICAL PROPERTIES OF TITANIUM COMPARED WITH 75ST ALUMINUM ALLOY AND 18-8 AUSTENITIC STAINLESS STEEL

	Titanium	75ST Aluminm	18-8 Austenitic Stainless Steel
Density—gm./cc	4.5	2.8	7.9
Young's Modulus—psi	15.5×10^6	10.3×10^6	28×10^6
Melting Point—° F.	3140	1220°	2800°
Thermal expansion/° F.	5.0×10^{-6}	12.7×10^{-6}	9.5×10^{-6}
Electrical conductivity—% I.A.C.A.	3.2	30	2.5
Thermal Conductivity—BTU/ft²/in/° F/hr.	105	835	115

*For pure aluminum or iron.

plications in which the combination of superior corrosion resistance and light weight are important; (4) industrial equipment in which titanium's particular corrosion resistance can be utilized; and (5) miscellaneous applications in which a combination of light weight, corrosion resistance, high strength and intermediate temperature properties are required.

Where titanium is substituted directly section-for-section in place of stainless steel, a 40 per cent savings in weight will result. Fig. 7, presented by Bradford illustrates graphically the comparative tensile strength properties at room temperature of commercially pure titanium, 75S-T aluminum, and 18-8 stainless steel.

(To be concluded)

Welders Get FCC Approval

Problem of radio interference from inert gas arc welders using high frequency pilot circuits has been solved in the IGT welder announced by Glenn-Roberts Co. Inc. of Indianapolis. This model utilizes a tube-type oscillator with extremely stable frequency characteristics, used with a modified torch providing maximum transfer of radio frequency energy. Greater arc stability reportedly is provided by the continuous, uninterrupted flow of high frequency current at 27,120,000 cycles per second during the entire welding cycle.

Rebuilding Worn Parts

Worn bearing surfaces, shafts, lathe spindles, mill rolls, propeller shafts, etc., can be repaired by a metallizing process and remachined to original tolerances by Bedford Gear & Machine Products Inc., Bedford, O. Process can also be used to repair blow holes in castings, provide a corrosion-resistant lining in plating tanks, make stainless steel overlay on rolls of various types and change or repair the contours of molds, the company states. The hard facing metallizing process can produce wearing surfaces having hardnesses up to 68 Rockwell C.

—o—

Simple arrangement of two revolving disks and a quick calculation make possible the computing of the weight of coils weighing hundreds of pounds or tons with the coil weight calculator available from F. J. Littell Machine Co., Chicago 13, Ill. Inside and outside coil diameters are set together on the calculator, this giving the pounds per inch of width of coil. This weight and the width of stock are then set together to obtain the total coil weight.

Add to the usual engineering advantages of this *type* of cap screw the extra values of greater strength and uniformly accurate cold forged forming—that's the result of applying the Kaufman Double Extrusion Process, without extra cost to you. Cleveland Socket Head Screws have perfectly concentric sockets, formed completely in the forging operation. It pays you to specify and buy Cleveland Socket Head Screws.

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street • Cleveland 4, Ohio
Warehouses: CHICAGO, PHILADELPHIA and NEW YORK

CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

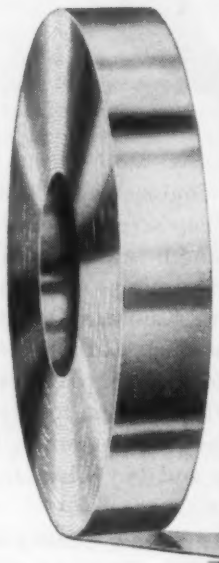
Reducing Diet for . . . inflated costs!

● Trim your production costs to neat, tidy figures right off the reel with a steady diet of *pre-coated* Thomas Strip.

Nickel coated Thomas Strip, for example, widely used as an ultimate product finish, saves many manufacturers the cost of operating plating equipment. It also serves as a ready base and eliminates much expensive surface preparation, where further plating is demanded.

The highly ductile nickel electrocoating—which Thomas applies to cold rolled strip steel of controlled metallurgy—can be drawn, stamped, bent and formed without fracture. It protects parts against corrosion, tarnishing and staining . . . during fabrication, in shipment and in use. It resists oxidation at elevated temperatures—resists scaling during heat treating.

Replacing more costly metals with ready-to-fabricate nickel coated Thomas Strip usually maintains all production and quality standards. It gives finished parts the cost advantages of steel, plus the functional and appearance advantages of nickel. *Pre-coated* Thomas Strip currently is available for prompt delivery according to your specifications—in a broad range of finishes, gauges, widths and temper. Write us for more information, for samples and metallurgical assistance—without obligation.



THE THOMAS STEEL COMPANY • Warren, Ohio

Specialists in Cold Rolled Strip Steel

Electrocoated with Nickel, Copper, Zinc and Brass • Hot Dipped Tin and Lead Alloy • Lacquer Coated in Colors • Annealed and Tempered Spring Steel • Alloy Strip Steel • Uncoated Strip Steel Produced to Your Specifications.

Improves Quality . . . Cuts Parts Costs

Automatic Operation

(*Concluded from Page* 118)

as diesel engine injector barrels, is eliminated along with a number of finishing operations and selective fits with another of the company's recently developed units. Machine holds size to 0.0001-inch on the diameter and geometrical accuracy to 0.000025-inch.

Two opposed surfaces may be simultaneously finished to precision limits with either loose or bonded abrasive on a machine called the Microflat. Type of abrasive is said to depend upon the amount of stock to be removed and finish required.

Parts Automatically Gaged

Use of an idle index station where heat generated from the removal of 0.002 to 0.004-inch of stock is dissipated is incorporated in a machine setup to hone the hardened steel bushings progressively. In the third position, final size, geometry and surface finish is generated. Automatic sizing interlocked with the machine and index controls is said to make this progressive feature possible. With the operator loading and unloading the fixtures, the parts are automatically gaged and the machine directed through the proper sequence of operations by electronic controls. A surface finish of 2 to 3 microinches rms is produced on 120 bushings per hour.

Head on a general purpose honing machine designed for tool room and reconditioning work is reciprocated hydraulically and inching of the head into the bore, reciprocation speed and withdrawal of the head are controlled by a single lever. Machine may be used for honing such objects as engine blocks or by mounting a riser block on a base it can be adapted to honing such small parts as connecting rods. Signal lights may be provided to indicate when the part is to size.

Saw Recommendation

Five sizes of regular type and two sizes of skiptooth metal-cutting band saws have been added to the revised simplified practice recommendation R214-48, metal cutting band saws (hard edge, flexible back), announced by Commodity Standards Division of National Bureau of Standards, Washington, D. C. It consists of a simplified list of stock types and sizes and width, thickness, and number of teeth per inch are listed for the two types of saws. Copies of the recommendation are available from the Government Printing Office for 10 cents each.

ROBINS CONVEYORS HELP SET NEW BULK MATERIALS-HANDLING RECORDS!

Stretching down the 700-foot-long pier at Curtis Bay in Baltimore are these four Hewitt-Robins conveyors.

Together they can load two ships at a time with 17,500 tons in less than 1 hour and 45 minutes. That's 10,000 tons an hour! No wonder this Robins installation has set new records for speed and efficiency!

You can be sure of speed and efficiency when you use Hewitt-Robins Conveyors to move coal, ore, limestone, etc. That's because every Robins Conveyor is designed, engineered and built by a single source—Hewitt-Robins! It's the only organization in the world that offers you a *complete* conveyor system . . . and takes full responsibility for *all* elements.

You see, H-R Conveyors are engineered with idlers, pulleys and drive built by Robins. You benefit by these three exclusive advantages of Robins Idlers: (1) *One-Shot Lubrication*—requires only half the time and only one walkway. (2) *Triple-Grease Seal*—seals grease in, locks dirt out. (3) *Rigid Truss Construction*—stronger than any other type of construction.

The belting of your H-R Conveyor is built by Hewitt. The strong, durable cover of this belting is made of shock-absorbing rubber which withstands extreme gouging, tearing and abrasion . . . resists moisture and mildew.

Little wonder, then, that Hewitt-Robins Conveyors can help you move your bulk materials more quickly . . . more economically!

HEWITT ROBINS CONVEYORS

Find out about Hewitt-Robins Conveyors now. Write to Robins Conveyors Division, Passaic, New Jersey, or Hewitt Rubber Division, Buffalo 5, New York.

ROBINS CONVEYORS DIVISION **HEWITT-ROBINS INCORPORATED**

Book Traces Industrial Growth of Pennsylvania

INDUSTRIAL Pennsylvania has now reached a stage in its evolution where an increasing number of business firms have a long and creditable history ranging from 50 to 100 or more years of continuous productive existence. The story of Pennsylvania's advancement is fully and accurately told in three volumes by Sylvester K. Stevens, state historian, executive secretary, Pennsylvania Federation of Historical Societies, under the title *Pennsylvania—Titan of Industry*. The first volume reviews the past, while the second and third volumes are devoted to sketches of individual companies, arranged alphabetically according to the company name.

Much of the early industrial history of Pennsylvania was conditioned by its streams, and the early course of expansion of industry was usually along the river valleys. The famous Durham boats, named for the Durham blast furnace in upper Bucks county, were one of the first major improvements in river transportation dictated by the need to get iron to market. These boats ranged from 50 to 60 feet long and about 8 feet wide with a depth of 2 feet and were able to load as much as 15 tons of iron.

While furnaces close to the navigable rivers, could get their product to market rather cheaply for the times, the product of many furnaces had to be carried by wagon or even pack horse to market. Iron bars were bent into a suitable U-shape by blacksmiths and some 200 fitted over the back of a mule. It was not unusual to see as many as 500 pack horses in divisions of 12 to 15 loaded with iron and products for the western market.

Manufacture of iron had been going on in colonial America for more than 50 years before Pennsylvania was founded, yet by mid-eighteen century it had become the leading ironmaker of all the colonies.

At Cornwall, Lebanon county, Peter Grubb had built in 1742 the famous Cornwall furnace. The Cornwall operation tapped the richest single deposit of iron ore in Pennsylvania; the Cornwall mines are still producing for the Bethlehem Steel Co.

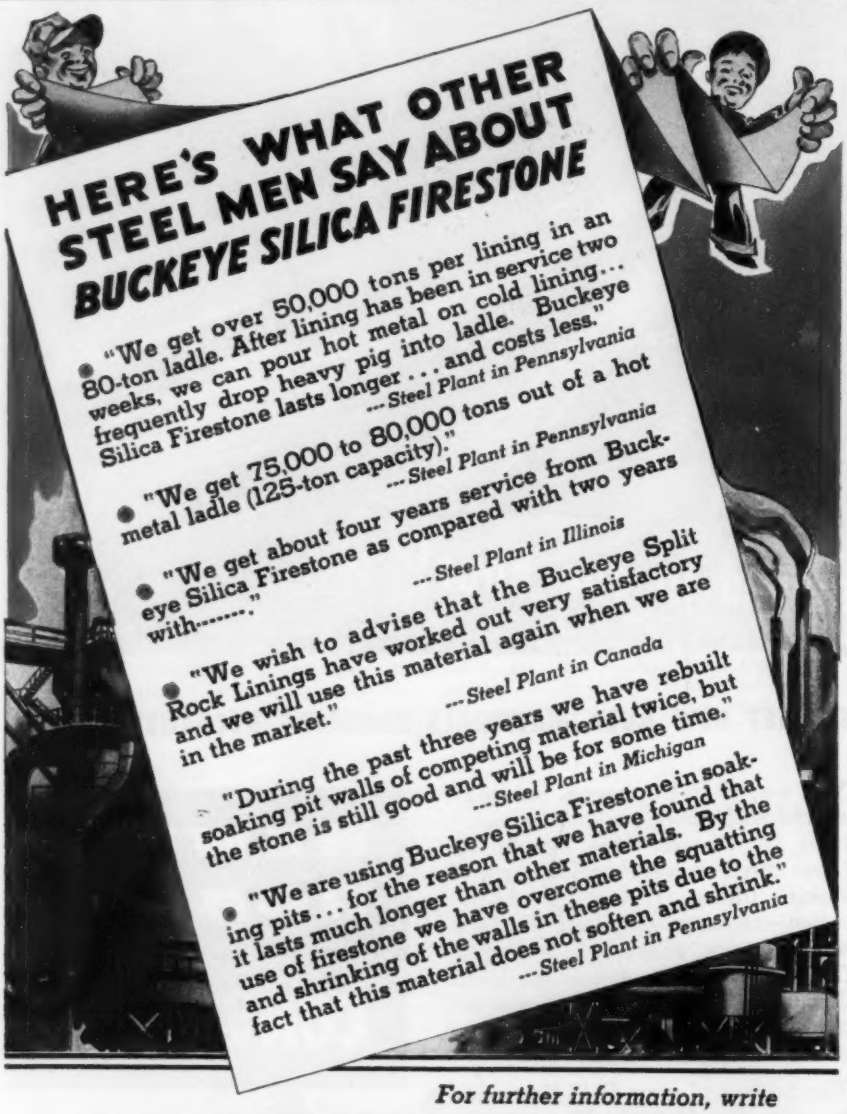
By far the most significant development of the closing years of the century, aside from the rise of the large mills and furnaces of southeastern Pennsylvania, was the expansion of the iron industry into western Pennsylvania and the opening of the famous Juniata region in the west central section of the state. All of these establishments were within the Bellefonte area and shortly made it one of the most important single producing centers for the famous Juniata iron of the nineteenth century.

Iron manufacturers spread directly westward across the Alleghenies as well. Alliance furnace, Fayette county, built in 1789, was the first furnace west of the Alleghenies. Many of the western operations, before 1800, appeared to have been short-lived. Supplies of iron ore were inadequate, labor scarce and the quality of the product somewhat inferior. As a matter of fact, iron made in Center county, was hauled by pack horse over the mountains to Pittsburgh

Use of blowing cylinders at furnaces and forges to replace the old-style wood and leather bellows, greatly improved the blast and was becoming general by 1800.

A few of "first things" contributed by the state of Pennsylvania are:

The first air furnace for remelting iron was opened in Pittsburgh in 1804 by Joseph McClurg. It became one of the principal manufactories of the region and produced most of the cannon and cannon balls used by Perry


HERE'S WHAT OTHER STEEL MEN SAY ABOUT BUCKEYE SILICA FIRESTONE
● "We get over 50,000 tons per lining in an 80-ton ladle. After lining has been in service two weeks, we can pour hot metal on cold lining... frequently drop heavy pig into ladle. Buckeye Silica Firestone lasts longer . . . and costs less."
---Steel Plant in Pennsylvania
● "We get 75,000 to 80,000 tons out of a hot metal ladle (125-ton capacity)."
---Steel Plant in Pennsylvania
● "We get about four years service from Buckeye Silica Firestone as compared with two years with-------."
---Steel Plant in Illinois
● "We wish to advise that the Buckeye Split Rock Linings have worked out very satisfactory and we will use this material again when we are in the market."
---Steel Plant in Canada
● "During the past three years we have rebuilt soaking pit walls of competing material twice, but the stone is still good and will be for some time."
---Steel Plant in Michigan
● "We are using Buckeye Silica Firestone in soaking pits . . . for the reason that we have found that it lasts much longer than other materials. By the use of firestone we have overcome the squatting and shrinking of the walls in these pits due to the fact that this material does not soften and shrink."
---Steel Plant in Pennsylvania

For further information, write

THE CLEVELAND QUARRIES COMPANY

1740 East Twelfth Street CLEVELAND 14, OHIO

BUCKEYE

"FOR THAT EXTRA SERVICE"

SILICA FIRESTONE

Century Type RS, repulsion start, induction, single phase brush lifting motors are ideal for installation on reciprocating pumps, compressors and other hard-to-start equipment.

They provide the power to start under load — even in very cold weather — without overmotoring the driven machine.

Repulsion start motors provide greater starting torque per ampere of current than any other type of single phase motor — consequently the least disturbance to line voltage — an advantage on long or small capacity transmission lines.

They are widely used in the rural areas which usually have only single phase energy.

Many power companies are recommending the use of single phase motors up to 7½ HP, in residential districts of the larger cities, because polyphase energy is not always available.

Century Type RS brush lifting motors are built in sizes from ½ to 20 HP.

Century builds a wide range of types of motors from 1/6 to 400 horsepower for all the popular electric power applications.

Specify Century motors for all your electric power requirements.

Popular types and standard ratings are available from factory and branch office stocks

CE-628

Century C MOTORS

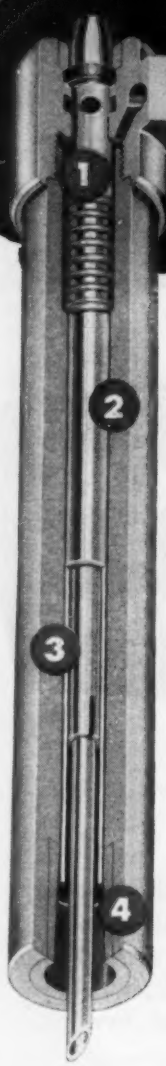
CENTURY ELECTRIC COMPANY • 1806 Pine St., St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

WEIGER-WEED
TRADE MARK

the holder designed as a perfect corollary to this well-known formula . . .

$H = I^2 R$



Weiger-Weed Electrode Holders can deliver more than enough cooling water for any resistance welding application using replaceable tips—without a sign of a leak! They are most dependable for long service, reduction of tip damage, down time and maintenance.

Quality to the same high standards is found in Weiger-Weed replaceable tips, seam welding wheels, projection welding dies, flash and butt welding dies and special alloy bars, forgings and castings. You are cordially invited to bring your resistance welding problems to Weiger-Weed. Long specialized welding engineering experience and every modern facility are at your service. Weiger Weed & Company, Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Ave., Detroit 4, Michigan.

1 Hardened stainless steel knockout plug, and leakproof water seal. Spring return assures free water ports and proper tip seating.

2 Non-rusting non-magnetic knockout tube.

3 Strong heavy body assures maximum conductivity, withstands heavy clamping pressure.

4 Hard alloy taper socket will not get out of round nor leak.

For complete line of WW quality welding supplies consult Weiger-Weed Bulletin 14.650. Send for it.

WEIGER-WEED
TRADE MARK

11504-B

Resistance Welding ELECTRODES
DIES • TIPS • WHEELS • HOLDERS
DIVISION OF FANSTEEL METALLURGICAL CORPORATION

for the fleet which defeated the British on the Great Lakes in the Battle of Lake Erie in 1813.

The first iron stove plates probably were cast at Colebrookdale about 1728.

The Franklin stove was first cast in 1742 at Warwick furnace in Chester county.

John Sellers, (1728-1804), near Philadelphia, appears to have been the pioneer in the making of wire in America.

Roebling's first suspension bridge was built across the Monongahela river, Pittsburgh, in 1846, following the invention and development of wire cable.

The first successful anthracite blast furnace was built at Pottsville and was put in blast Oct. 26, 1839. Expansion of anthracite blast furnaces was rapid and the anthracite region as a result became the great iron producing center of Pennsylvania before the Civil War.

Johnstown had the honor of producing the first bessemer converter steel in America. It was here that William Kelly built the first tilting converter and tried it in operation.

The first rolling mill in the country which puddled iron and rolled iron bars was built in 1816-1817 on Red Stone Creek, Fayette County.

The first slab of cast steel made in the U. S. was in Pittsburgh in 1846 and it was shipped to the Deere Plow Works at Moline, Ill.

In 1852, McKlevy and Blair in Pittsburgh made the first commercial production of cast steel in large quantities.

The first steel rails ever rolled upon order in commercial production were produced at the Cambria Iron Co., Johnstown, August 1867.

Toward the end of the colonial era, hammered sheet iron and plate were produced by tilt-hammer and plating mills in Pennsylvania. The process was similar to that used in producing bar iron but involved the use of a rapid blow type hammer. Rolling and slitting mills produced iron from wrought rails. Iron sheet bars were sheared by water-powered crocodile-type shears, heated, rolled to the desired thickness, reheated and then slit to a size suitable for nails. These were cut by blacksmiths.

The Federal slitting mill, built near Coatesville in 1795, was one of the earliest to roll sheet steel and slit nails in interior Pennsylvania.

Pittsburgh's Fort Pitt foundry under the superintendency of William Metcalf was one of the leading makers of armor plate and heavy ordnance for the Union. It was armor plate from this foundry which was used on the iron-clad steamers built at Philadelphia.

Other topics dealt with in Volume 1 include Steel, Textile in Other Industries, 1870-1900; Pennsylvania and the Machine Age, and Pennsylvania Industry in the Twentieth Century. In addition to a selected bibliography, this volume is well indexed and profusely illustrated.

The second and third volumes are devoted to sketches of individual companies, arranged alphabetically according to the company's name. Virtually every type of industrial classification is represented, totaling 344 companies.

Pennsylvania — Titan of Industry in 3 volumes contains 1485 pages, 7½ x 10½ inches. It is published by the Lewis Historical Publishing Co., County Trust Bldg., New York 11, N. Y., for $58.50 for the set of 3 volumes.

Instrument Records Steel Formability

Measurement of a magnetic property inherent in steel indicates whether or not one kind of steel can be cupped to cap a ketchup bottle and a steel of a different kind can be shaped into automobile fenders and bodies. This magnetic property is said to provide a clue to the formability of steel and is recorded by a new instrument, called the recording torque magnetometer. Designed by the research laboratory of the United States Steel Corp. of Delaware, the instrument is said to plot a conclusive and accurate magnetic torque curve of any steel in 6 minutes. The sample used is a flat disk.

Principle of the instrument, noted in STEEL, April 25, page 79, may be explained in terms of a common horseshoe magnet and a sample disk of steel. If the magnet is held with legs upright and the disk rotated horizontally within the magnetic field between the two legs, the field is said to affect the sample variously at various points of rotation. As it turns, the disk resists rotation in some positions, while in others it has a tendency to assist rotation.

In the torque magnetometer, the two legs of the horseshoe magnet are replaced by two strong electromagnetic coils, placed end to end with a short gap between them. The specimen disk is mounted horizontally between the coils and rotated one-half revolution in 6 minutes. Beneath the sample and attached to its mount is a strain gage which measures the twist toward the preferred direction of the samples tiny magnetic particles. Measurements are translated automatically by a moving pen from gage to chart paper of a recorder.

It is said that if deep caps or rich curves are to be formed, as in ketchup bottle tops, fenders, washing machine tubs and cooking pots, steels with little magnetic directional properties are preferred. If the steel being tested is of a composition high in silicon and it is to be used to make cores for transformers, a strong directional indication is preferred, but minimum directional properties in the same type of steel are desired for electric motors and generators.

The research laboratory instrument is said to have made magnetic torque testing automatic and practical in mills as well as laboratories. Improved models of the magnetometer are in operations use at the Gary, Ind., sheet and tin plate mill and in the Vandergrift silicon steel mill at Irvin Works, both of Carnegie-Illinois Steel Corp.

SPEEDER WELDING

QUALITY

LOWER COST

APT COMPANIONS TO MUREX ELECTRODES-

ENGINEERED TO GIVE YOU BETTER WELDER PERFORMANCE

You'll experience entirely new arc welder performance—faster welding, better quality welds, lower power costs, and less maintenance—with the new, up-to-the-minute M & T AC and DC arc welders.

AC units feature *Built-in Capacitors* for low operating cost... *Fingertip, Stepless Current Control* for precise welding current... *Wide Current Range* plus *Ample Overtravel* for full rated output with long electrode leads. Furnished in 200 to 500 amp models for manual work; others for inert arc and automatic welding.

DC units are *Compact and Lightweight*... half as big and half as heavy as older types... yet are built for full capacity, rugged industrial duty... and are equipped with *Automatic Current Selector*. Available in 150 to 400 amp models—motor-driven, engine-driven, belt-drive.

M & T welding machines go hand in hand with M & T's "Select 70" group of electrodes and with M & T accessories to provide everything needed for arc welding... arc welding of top-notch quality. Write today for descriptive data.

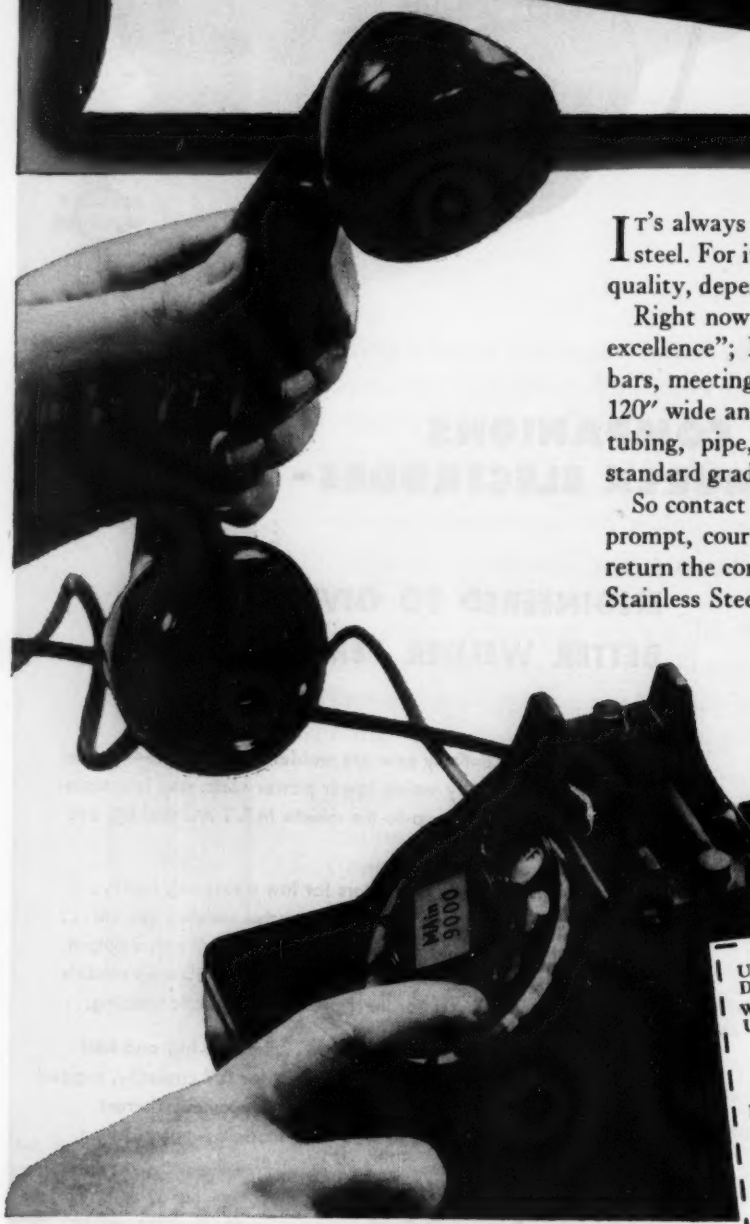
METAL & THERMIT CORPORATION

120 Broadway • New York 5, N. Y.

CHICAGO CINCINNATI CLEVELAND
NEWARK PHILADELPHIA PITTSBURGH

Need Stainless Steel?

TRY US FIRST



It's always wise to "Try Us First" when you need stainless steel. For it's a fact that *U·S·S* Stainless Steel is "tops" in quality, dependability and proven excellence.

Right now our stocks include No. 2B Finish Sheets "par excellence"; No. 4 Finish Sheets of uniform quality. Also bars, meeting high standards of machinability; plates up to 120″ wide and 360″ long . . . as well as welded and seamless tubing, pipe, angles, channels, welding electrodes in all standard grades and specifications are on hand for your needs.

So contact our nearest warehouse or sales office. You'll get prompt, courteous service. Meanwhile, why not fill in and return the convenient coupon for our free booklets on U·S·S Stainless Steel? Do it now.

UNITED STATES STEEL SUPPLY COMPANY — USS STEELS — SERVICE

Symbol of Service for Steel Users

United States Steel Supply Company
Dept. F-6-20, 208 S. La Salle St., Chicago 4, Ill.
Without obligation on our part, please send us FREE booklets on U·S·S Stainless Steel as checked below:

☐ Introduction to Stainless Steel ☐ Fabrication of Stainless Steel

Name..... Title.....

Firm Name.....

Address.....

City..... Zone..... State.....

UNITED STATES STEEL SUPPLY COMPANY

Warehouses: BALTIMORE · BOSTON · CHICAGO
CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK · PITTSBURGH
PORTLAND, ORE. · SAN FRANCISCO · SEATTLE · ST. LOUIS · TWIN CITY (ST. PAUL)
Also Sales Offices at: KANSAS CITY, MO. · PHILADELPHIA · TOLEDO · TULSA · YOUNGSTOWN
Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

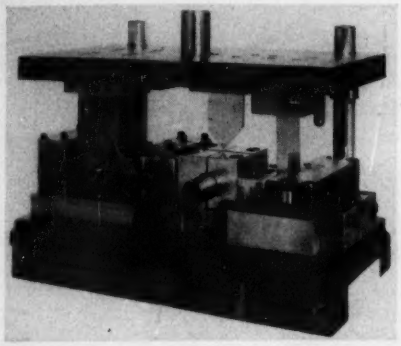
USS

UNITED STATES STEEL

New Products and Equipment

Tube Cutoff Die

Straight cutting of tubing into any desired length with a minimum of burr and no perceptible distortion of the tubing is possible with the new arc fit tube cutoff die, announced by Vogel Tool & Die Corp., Chicago, Ill., distributed by G. H. Wood & Sons Inc., Laporte, Indiana. As many as



10,000 cuts per hour are possible with the device, the cutting speed depending upon the operating speed of the punch press in which it is installed

Tube cutoff die can be provided to cut various shapes of tubing, such as round, square, rectangular or hexagon up to 4 inches OD. Interchangeable die blocks permit quick changeover from one diameter of tubing to another. It will cut at 90 degrees to the access of the tubing. Stops are provided to cut to a practical tolerance.

Check No. 1 on Reply Card for more Details

Vapor Degreaser

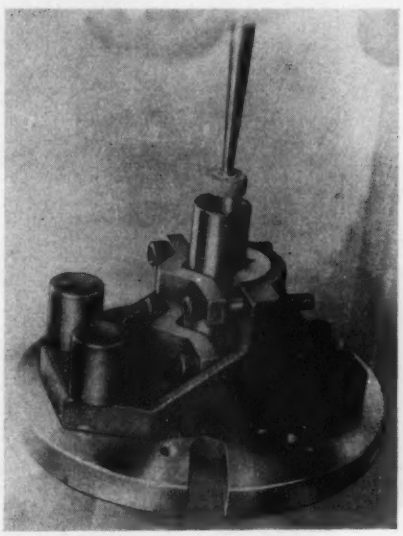
Electrically heated and thermostatically-controlled, is the Chief model twin-tank degreasing machine, introduced by Circo Products Co., 12117 Berea Rd., Cleveland 11, O. It has a stainless steel hot vapor tank for degreasing. A galvanized steel dip tank of the same dimensions, 18 x 18 x 32½ inches, is for flushing, dipping and soaking parts to be cleaned. Hot vapor tank takes 5 gallons of nonexplosive and nonflammable Per-Solv solvent which is vaporized by heat applied externally through 220 v electric heating elements.

Vapor penetrates grease and oil on the parts suspended in the degreaser tank, then condenses and washes the soil down to the bottom of the tank. A thermostat near the top of the vapor tank controls the vapor height, preventing loss of vapors into the atmosphere. On the underside of the tank is another thermostat which automatically shuts off the heat when the solvent mixture is too contaminated for further use. Dipping and flushing tank takes approximately 20 gallons of solvent.

Check No. 2 on Reply Card for more Details

Work Holder

Quick and accurate setup on lathes, grinders, jig borers, milling machines and drill presses are possible with the model R work holder, developed by Lassy Tool Co., 96 Bohemia St., Plainville, Conn. Made of close grained cast iron, normalized to retain accuracy, the work holders have clamps which are case hardened. Slots enable clamps to be quickly re-



versed without removing screws. Round steel insert is hardened and ground, the V having a recess for holding objects such as punches with heads.

Counter balancing weights have eccentric holes for easy balancing. Capacity of the work holder is from ⅛ to 2 inches. It measures 3 x 4½ x 7 inches. Accuracy is said to be 0.002-inch in 3 inches.

Check No. 3 on Reply Card for more Details

Fluid Transfer Unit

A portable unit for the transfer and filtration of fluids is offered by J. N. Fauver Co. Inc., 49 W. Hancock Ave., Detroit 1, Mich. Mounted on the truck with the electrically driven pump are both a metal edged strainer and micronic type filters. In the transfer process, valves are so arranged that either one or both, or neither of the filters can be used.

Equipment can be used in the cleaning of batches of paint, coolant, kerosene, solvents, hydraulic and lubricating oils, etc. Standard capacities are 5, 10, 15, 20, 40, 50, and 80 gallons per minute. Units can be supplied with suction and discharge hose assemblies.

Check No. 4 on Reply Card for more Details

Paint Spray Unit

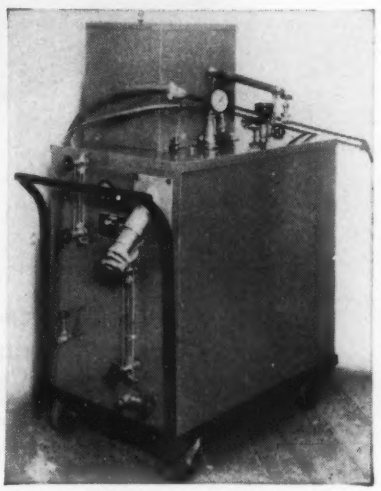
Weighing only 47 pounds, the model DP portable paint spray unit, made by Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill., delivers 40 pounds working pressure in ample volume to operate standard Binks spray guns. The direct drive piston models will handle enamels, lacquers, outside paints, shellac, varnishes and other coatings.

Operation is from any 110-120 v ac line. Compressor measures 7½ x 11½ x 15⅞ inches. It has no exposed moving parts and the motor has a safety cut-out overload switch.

Check No. 5 on Reply Card for more Details

Steam Jet Cleaner

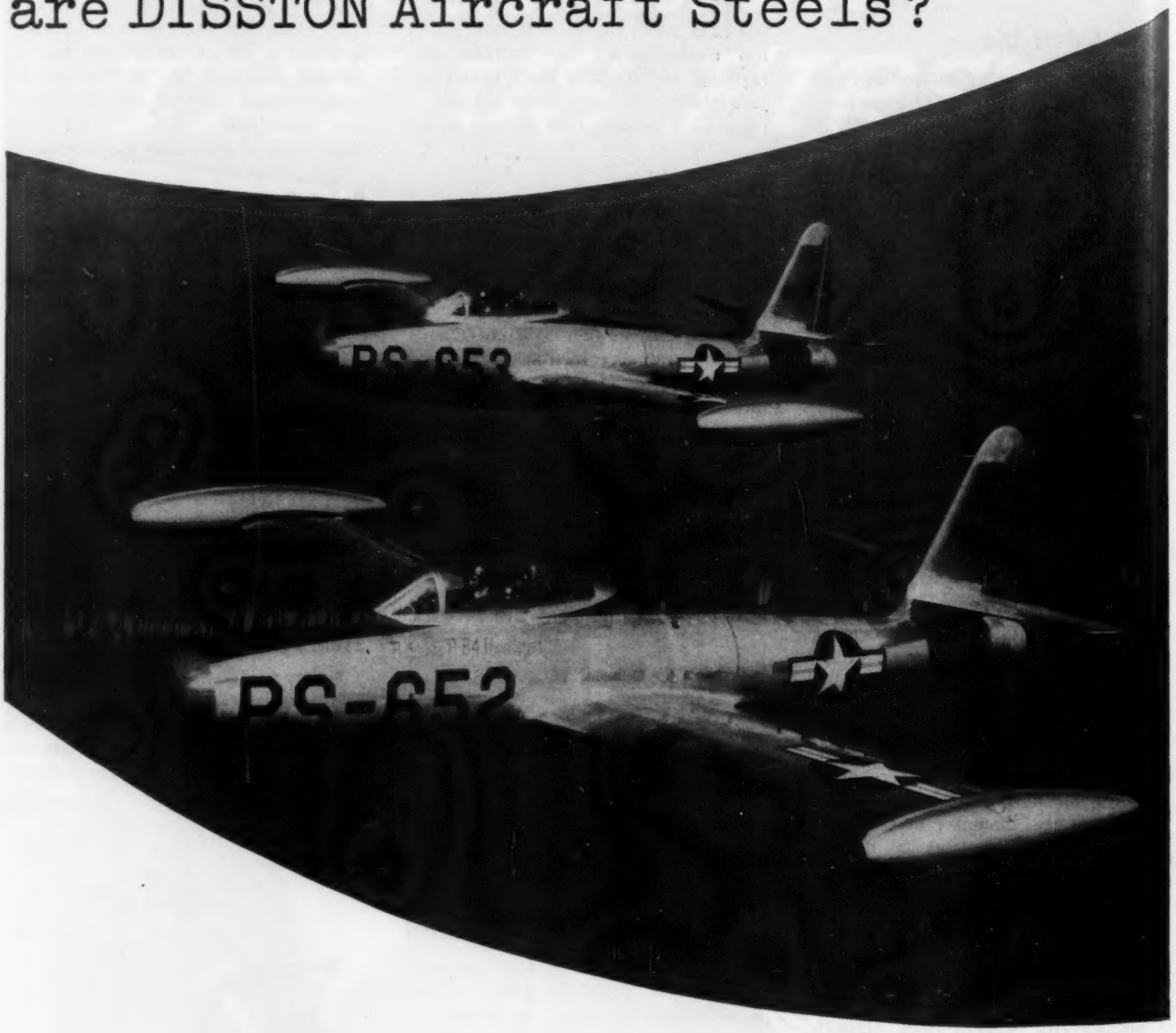
Easily portable, fully automatic and maintenance-free is the Speedylectric JC-30 steam detergent cleaning unit developed by Livingstone Engineering Co., 100 Grove St., Worcester 5,



Mass. Using high pressure steam from its built-in boiler, the unit mixes it with the proper amount of detergent at the jet, there being no excess water to dilute or flood the working area. Boiler and jet are under fingertip control of the operator.

Cleaning unit has a pressure tank to assure flow of detergent. High ceilings, tall machines and large equipment therefore may be steam cleaned without height limitation. Weight of the unit is about 500 pounds and it is mounted on an all

Where in the Thunderjets are DISSTON Aircraft Steels?



"Disston Aircraft Steels are used so extensively in the manufacture of this plane that . . . a picture of the completed airplane would be best."

--REPUBLIC AVIATION CORPORATION

Uncle Sam salutes Republic Aviation for developing and mass-producing Thunderjet fighters. His pleased look takes in Disston, too. For Disston Aircraft Quality Steels are "showing their stuff" in many crucial parts of this great jet plane. It is capable of speeds up to 600 mph—proof enough that steel specifications are rigorous, and that Disston Steels qualify.

Widely used in both the military and civilian fields, such Disston Aircraft Steels as AISI 4140—4130—4340—have earned complete respect. Produced in Disston electric furnaces, to live up to Disston Magnaflux quality standards, these steels rate consistently high under test. Yield strength and tensile strength fulfill strictest requirements. Elastic limit, elongation and reduction of area can be certified without qualification. Tests for grain size and hardness; also deep etch further prove the extreme uniformity of Disston Aircraft Quality Steels.

Rounds, squares, flats and hexagons of desired dimensions are obtainable. Or you may have special needs. Skilled Disston metallurgists know how to satisfy you . . . *with exactness.*

HENRY DISSTON & SONS, INC.

626 Tacony, Philadelphia 35, Pa., U. S. A.

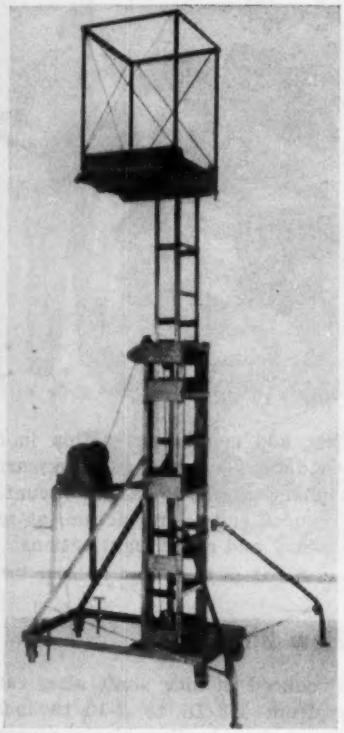
WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

steel dolly with ball bearing rubber tired swivel casters. Operation is on 220 ac and over, single or polyphase.

Check No. 6 on Reply Card for more Details

Extension Scaffold

Starting as a 6-foot ladder and extending to a 20-foot scaffold in less than 5 minutes is the utility model Hi-Lift extension scaffold designed by Atlas Industrial Corp., 849 39th St., Brooklyn 32, N. Y. Occupying a floor space as small as 29 x 54 inches, the unit is easily handled through door and elevator openings.



Operation is by one man. For easy maneuvering in tight places, the scaffold is equipped with roller bearing swivel casters on all four legs. It has outriggers for extra stability.

Check No. 7 on Reply Card for more Details

Die Burs

Dies for working on tough die steels which produce harmless granular chips instead of needle-like die steel slivers that are dangerous to the machine operator are being produced by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn. The Keller die burs are available in a wide variety of shapes and sizes and may be had in fine, standard or coarse cuts.

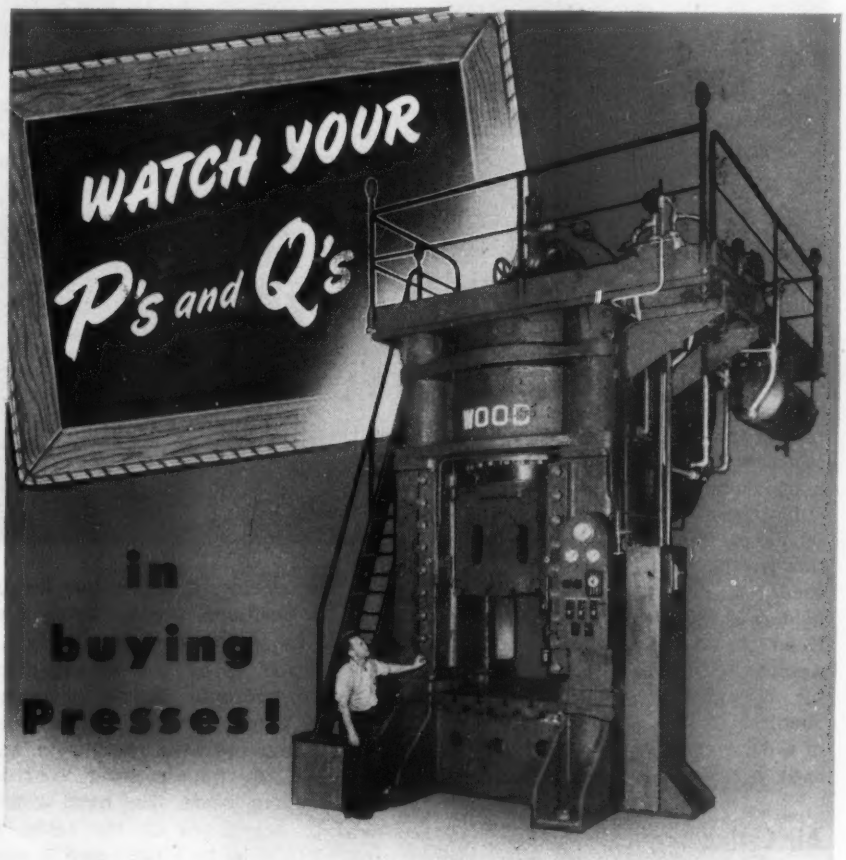
Burs are master ground from solid blanks, center fluted and have uniformly spaced flutes with correct rake angles. They are easily controlled and produce finishes similar to those obtained with mounted points. They are not recommended for cast iron and nonferrous work.

Check No. 8 on Reply Card for more Details

Brazing Machine

Six high velocity and 24 open-flame burners on an automatic gas-fired machine developed by Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa., attach ventilated ribs to tapered steel tubes with 13 simultaneous silver alloy brazings at the rate of 40 tubes per hour. The burner system, controlled automatically to give the required heat input and time, is positioned for an exact brazing heat pattern.

Area heated by the six high velocity burners is brought to approximately 1300° F and controlled to maintain the tubes at room temperature 1 inch from the working area. The machine, measuring 6 feet long, 2 feet 6 inches high and 1 foot 9 inches wide, consumes 390 cu ft of 530 Btu gas per hour. A combustion controller supplies the correct combustion mixture of gas and air, at constant pressure, to the machine.



POWER:

You want a press with sufficient power—in construction and in doing a job—to give you trouble-free production on a variety of operations. Take the R. D. Wood 2000-ton Hydraulic Forming Press shown, for example. It's a powerful, heavy-duty, automatic, self-contained press used for forming, hot forging, coining and forcing. Designed in capacities from 100 to 5000 tons, it has the power you need in *your* plant.

QUANTITY:

You want a press that can turn out the quantity of work necessary in the modern-day plant—efficiently and with a minimum of maintenance. R. D. Wood Hydraulic Presses have the design features, the materials, and the workmanship required for quantity production at low cost. Write for literature today on hydraulic presses or hydraulic press problems. R. D. WOOD COMPANY, Public Ledger Building, Philadelphia 5, Pa.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ACCUMULATORS • INTENSIFIERS

EST. 1803

R. D. Wood Company

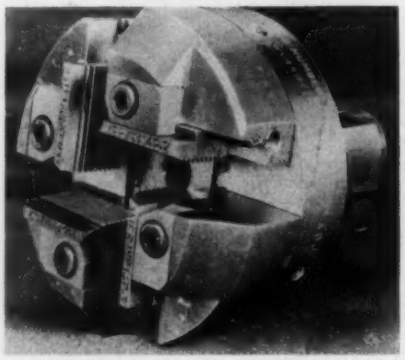
PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

Installation is equipped with fire checks and safety blowouts.

Check No. 9 on Reply Card for more Details

Die Heads

Designed for use on automatic machines for threading street ells and similar cast iron fittings where clearances are limited between the die head and the machine are the ½ and ¾-inch solid adjustable die heads offered by Landis Machine Co., Waynesboro, Pa. Diameter of the



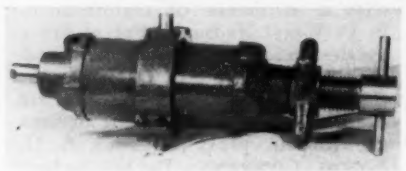
die head is 3¾ inches and to provide further clearance, the chaser holders are beveled off on a 45 degree angle.

Chaser holders are mounted on the face of the head body. Individual adjustment is provided for each chaser holder, which permits a plus or minus adjustment of approximately 1/32-inch on the pitch diameter. Although the same head body can be used, a different set of chaser holders is required for each diameter. Head shown is driven by means of square on the shank and is centered by a cylindrical portion of the shank. It is held in position by means of a draw rod through the spindle.

Check No. 10 on Reply Card for more Details

Air Cylinder

Anker-Holth Mfg. Co., 2723 Connors St., Port Huron, Mich., is manufacturing an air cylinder which has a false piston forming the movable



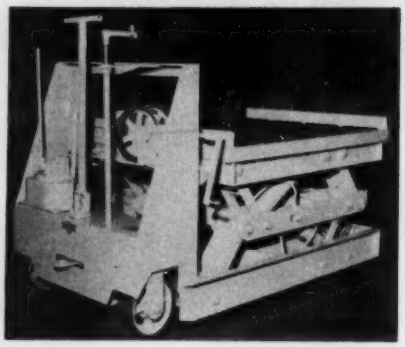
blind end which is attached to an adjusting screw to give any desired length of stroke. Full stroke adjustment or any part of the stroke is possible. The false piston maintains an air tight seal, limiting the dead air space.

Air is passed through a swivel connection attached to the adjusting screw to feed the piston on the "out" stroke. A hand wheel locks the adjustable screw in any position. Cylinders are manufactured in bore from 3 to 14 inches. Maximum cylinder stroke, amount of adjustment required, type of mounting and pressure may be varied.

Check No. 11 on Reply Card for more Details

Die Trucks

Dies weighing up to 16,000 pounds may be handled with the hydraulic elevating die handling truck offered by Lyon-Raymond Corp., 2403 Madison St., Greene, N. Y. Truck platform measures 48 x 57 inches. The roller top consists of five rows of rollers placed on 4-inch centers. With the roller top in place, the platform can be lowered to 24 inches or elevated to 38 inches. Removal of



the top provides 3 inches less height in both positions, the die being supported by a flat steel top.

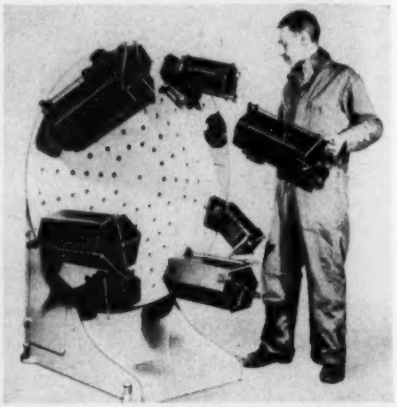
Elevation is by the arrangement of four hydraulic hoists operating against toggle levers. A two-speed hand pump operates the hoists and a finger tip release lever controls the lowering speed. The hand winch, used to draw dies on the table, is geared to a 96 to 1 ratio and is supplied with 25 feet of steel cable. Truck can be firmly secured by a screw type lock that engages the floor. Ten-inch wheels roll on ball bearings and an auto type steer arrangement is provided.

Check No. 12 on Reply Card for more Details

Multiple Tumbling Barrel

Up to 15 different items can be handled at one time without mixing and each can be tumbled in the manner best suited to its requirements with the multi-barrel deburring and polishing machine, offered by Hungerford Corp., Big Flats, N. Y. Variables include wet and dry tumbling, wide range of speeds, rotary, centrifugal and end-to-end actions and combinations of these actions.

A circular mounting plate, with multiple perforations at center and six distances from the center for attachment of the barrels, is rotated at a fixed speed. The barrels, of numerous lengths and diameters, are of round, hexagonal, clover-leaf, or special cross-section and can be furnished with or without Neoprene lining. They are mounted at right or other angle to the plate. Center mounting produces a mild rotary action and selective distances from the

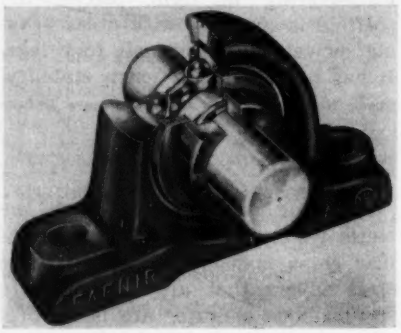


center add centrifugal action in desired degree, according to increasing periphery speeds. Angle mounting introduces end-to-end action, as well as rotary and centrifugal actions.

Check No. 13 on Reply Card for more Details

Pillow Blocks

Produced in nine shaft sizes ranging from 1-3/16 to 2-15/16 inches is the series of pillow blocks equipped with Mechani-Seal ball bearings, announced by Fafnir Bearing Co., New Britain, Conn. Each of the LAO series blocks incorporates a heavy series ball bearing with wide inner



ring and self-locking collar. The Mechani-Seal is a labyrinth type closure plus an external slinger member to throw off contaminants while operating at normal speed.

Added protection at low speeds or under adverse atmospheric conditions is provided by a combination synthetic rubber felt washer incorporated

PIPE LINE TO TREASURE

Seeking profits through a pipe driven deep into the earth is an investment which sometimes pays off in spectacular fashion. Too often, unfortunately, the investment brings nothing but a "dry hole."

A Clearing press is a pipeline to profits, too—far more certain, if less spectacular, than drilling for oil. Definite reductions in manufacturing costs are achieved by faster output, fewer rejects, longer die life. Let us tell you about the Clearing features of design and construction that account for these accomplishments.

CLEARING MACHINE CORPORATION
6499 West 65th Street · Chicago 38, Illinois

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

as an integral member of the seal. Bearing has a spherical outside diameter which, when mounted in its corresponding spherical housing, provides unrestricted self-alignment in any direction.

Check No. 14 on Reply Card for more Details

• • •

TRANSFORMER: General Electric's Meter and Instrument Divisions, Schenectady 5, N. Y., have developed a new line of butyl-molded transformers. JKM-3 is designed for accurate indoor metering and relay services. It is rated at 5000 v at 25-60 cycles and will be available with single primary in all preferred ratings, 10 to 800 amp inclusive.

Check No. 15 on Reply Card for more Details

TESTER: A self-contained, portable electronically controlled insulation resistance tester has been developed by Holtzer-Cabot Inc., Boston 19, Mass. A broad testing range is provided from 0 to 100 megohms. Unit operates by turning a small hand crank in either direction at a moderate speed to actuate a compact alternating current brushless type generator.

Check No. 16 on Reply Card for more Details

ROTARY DRILL: A midget size ¼-inch capacity rotary drill, called the Master Power M-900, is introduced by Master Pneumatic Tool Co. Inc., Orwell, O. It is available in free speeds of 1200, 2400 and 4800 rpm for use in drilling up to and including ¼-inch holes in all materials and metals.

Check No. 17 on Reply Card for more Details

TOGGLE CLAMP: Model 225-U toggle clamp has been developed by Detroit Stamping Co., Detroit 3, Mich., to meet demand for small, compact clamping unit with clamping bar moving into a retracted, vertical position away from work as clamp is opened.

Check No. 18 on Reply Card for more Details

RATCHET ADAPTER: J. H. Williams & Co., Buffalo 7, N. Y., offers a new patented ratchet adapter made from alloy steels. It is used with any of the ½-inch square drive handles or attachments such as speeders, T handles, flex handles, etc.; increases versatility of driver selected by converting it to a ratchet tool.

Check No. 19 on Reply Card for more Details

CLAMP AMMETER AND VOLTMETER: A new alternating current clamp ammeter and voltmeter, with five current ranges up to 1000 amp and three voltage ranges up to 700 v, has been announced by Weston Electrical Instrument Corp., Newark 5, N. J. Known as model 633 type VA-1, it is designed to measure alternating currents and voltages without interrupting electrical service.

Check No. 20 on Reply Card for more Details

LIGHTING FIXTURE: Model 10 miniature fluorescent lighting fixture has been developed by Stocker and Yale, Marblehead, Mass., to provide an intense but cool and glare-free illumination for critical work areas. It produces a light intensity of 550 foot-candles at a 3-inch working distance from twin 4-w fluorescent lamps.

Check No. 21 on Reply Card for more Details

VALVE: A specially designed, all stianless steel valve for mixing liquid or gaseous sulphur dioxide and water is announced by Ansul Chemical Co., Marinette, Wis.

Check No. 22 on Reply Card for more Details

POWER JACKS: Duff-Norton Mfg. Co., Pittsburgh 30, Pa., announces improved air motor power jacks for rigging and handling heavy industrial machinery, sinking piling, straightening steel pipe and general plant maintenance. Operated by an integral air motor under normal shop air pressure of 80 to 90 pounds.

Check No. 23 on Reply Card for more Details

GAGE BLOCK: To eliminate heat transmitted from hands to block, Thermo-Guards are inlaid in all 2, 3 and 4-inch steel and carbide blocks, completely insulating the block. Thermo-Guard gage blocks are made by Webber Gage Co., Cleveland 11, O.

Check No. 24 on Reply Card for more Details

PERMEABILITY TUBE: To test the permeability meter, Harry W. Dietert Co., Detroit 4, Mich., has developed No. 352 Master permeability tube. It contains an actual permanent sand standard which may be used with the orifice or stopwatch as desired. Four ranges, 25, 50, 100 and 150 permeability, are available at present, exact value being stamped on each tube.

Check No. 25 on Reply Card for more Details

SUBZERO EQUIPMENT: J. R. Miller Corp., Detroit 12, Mich., announces custom-built subzero automatic equipment ranging from a 3 cubic foot cabinet to specially designed test rooms. Temperatures of 100 to 130° F below zero can be provided. Extremely close electronic temperature control is available to maintain accuracy within one tenth of 1°.

Check No. 26 on Reply Card for more Details

DRILL: Mall Tool Co., Chicago 19, Ill., announces a new 1¼-inch capacity electric MallDrill, model 540A, designed and engineered for all types of heavy construction and maintenance work. It is available with 150 or 90 rpm. Features a Universal motor for 115 v, ac-dc.

Check No. 27 on Reply Card for more Details

LAP: Known as Xpand-O-Lap, a self-expanding lap consisting of one steel arbor, two copper sleeves and one S-shaped spring is offered by Chicago Broach Co., Chicago 44, Ill. Sleeves are self-aligning when tool is inserted in a hole for lapping. Laps are provided in sets of six ranging from ⅛ to ½-inch in steps of 1/16-inch.

Check No. 28 on Reply Card for more Details

ADAPTERS: Kase Machine Co., Cleveland 19, O., announces a new line of eccentric bushing type adapters for use with standard ⅜, ⅝, ¾, 1 and 1¼-inch Glenny broaches. Adapters features 0.005-inch accuracy and are fabricated from hard chrome plated steel. Available in sizes ranging from ½ to 2 inches outside diameter.

Check No. 29 on Reply Card for more Details

SERVICE COCKS: For working pressures up to 125 pounds on gas, oil, or water lines, Walworth Co., New York 17, N. Y., introduced new, high-pressure lubricated service cocks. Available in ¾ and 1-inch sizes, they have cast iron bodies and bronze plugs and are made with both screwed recessed ends and Dresser super service ends.

Check No. 30 on Reply Card for more Details

END MILLS: A new line of end mills developed by Wendt-Sonis Co., Hannibal, Mo., are available in styles for machining all types of steel, nonferrous materials and cast iron. They are made in straight and taper shank styles with straight and right or left hand spiral flutes; sizes range from ¼ to 2 inches.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

DOWNTREND in steelmaking operations promises to accelerate over coming weeks. Currently the ingot rate continues its slow decline under way since March, last week falling only one point from the week preceding to 86.5 per cent of capacity. However, a substantial drop in production is in prospect next month when many steel consuming plants will go down for mass vacations for anywhere from a week to two weeks. In some cases, shutdowns are likely to be for even longer periods because of lack of new business.

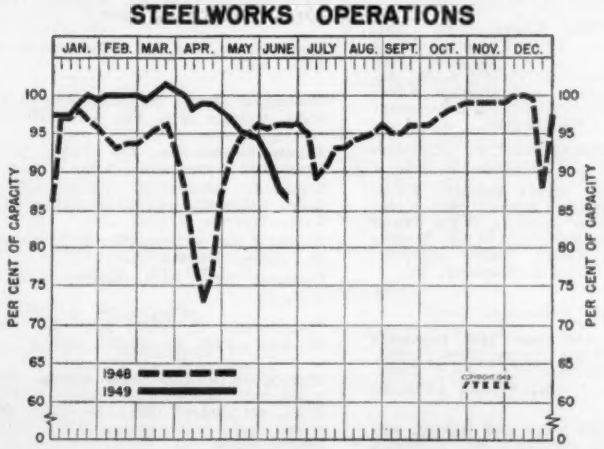
OPERATIONS—Accelerating decline is reflected in pig iron production, some blast furnaces now are being blown out because of lack of orders, with the probability that they will not resume production again until late summer or early fall. Coke oven operations also are being trimmed, not so much because of the threat of a prolonged coal strike, but because of poor business prospects over the next few months. Both pig iron and coke producers have accumulated stocks which should be sufficient to meet customers' curtailed requirements.

DEMAND—While the volume of business of most metalworking industries, excepting automotive, is down sharply from postwar peaks steel continues to be consumed in heavy volume. As a matter of fact, manufacturing operations in most lines of consumption still are higher than in the better prewar production years. Steel output currently is about 50 per cent above the 1937-1939 monthly average and about equal to 1941 production. There is no question steel buyers are eating into inventories and will be forced to return to the market before too long if current operating rates are maintained. At the moment, however, the tendency for buyers is to hold orders to a minimum.

PRICES—For the time being the steel markets are quiet pricewise. Premiums continue to fade out of the picture but no changes in the basic price structure have yet been noted. Undertone of the markets, however, continues weak. Last week two eastern producers effected downward adjustments in premium prices on plates, hot-rolled sheets, high-strength low-alloy plates and bar bands. At the same time several producers announced additional adjustments in galvanized product prices to reflect further reductions in the price of zinc. STEEL's composite on finished steel last week eased to $91.82 from $92.09 the preceding week and compared with $80.27 for the like week a year ago. The steelmaking scrap composite also declined, reflecting continued sluggish demand with steel mill inventories large and foundry requirements extremely small. The scrap composite now stands at $21.25 which compares with $21.50 the week preceding and with $40.67 a year ago. The semifinished steel composite held unchanged at $66.72, as did steelmaking pig iron at $45.60.

LABOR—Slowing down of the economy from postwar peaks is not deterring the labor unions from pressing new demands for wage increases and other advantages, such as pensions and social insurance programs. Whether this means the nation is in for a period of severe labor strife is not yet clear. One thing is certain, however. The demands of the various unions are being strongly resisted by employers. The "quickie" walkout in the coal mines, which may mean suspension of mining for a protracted period in view of the approaching miner vacation period and, still later, termination of the current contract, so far has not materially affected steelmaking and general manufacturing operations. Most consumers' stocks are sufficient for 60 days or more. Negotiations between the United Steelworkers and several steel producing companies for wage increases and insurance programs opened last week. Indications are independent steelmakers will await outcome of U. S. Steel negotiations before signing new agreements.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended June 18	Change	Same Week 1948	Same Week 1947
Pittsburgh	84	+ 2*	94	100
Chicago	96.5	— 2*	95.5	95.5
Eastern Pa.	83	— 2.5	90.5	93
Youngstown	89	— 4	103	93
Wheeling	69	—11.5	94.5	89
Cleveland	97	+ 0.5*	95.5	92.5
Buffalo	91.5	—10	99	88.5
Birmingham	100	None	100	99
New England	58	None	78	92
Cincinnati	97	+ 3	98	85
St. Louis	66.5	— 7	89.5	84.5
Detroit	101	+11*	100	88
Western	83	— 2.5	..	..
Estimated national rate	86.5	— 1	96	96.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * Revised.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	June 18	June 11	Month Ago May 1949	Year Ago June 1948	5 Years Ago June 1944
Finished Steel	$91.82	$92.09	$93.36	$80.27	$56.73
Semifinished Steel	66.72	66.72	66.72	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	45.66	40.49	23.00
Steelmaking Scrap	21.25	21.50	22.29	40.67	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

May 1949	3.98873c
Apr. 1949	4.02031c
Mar. 1949	4.05098c
May 1948	3.58321c
May 1944	2.44428c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip, May, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	June 18, 1949	May 1949	Mar. 1949	June 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.43c	2.875c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.365
Steel bars, Chicago mills	3.35	3.35	3.35	2.875
Shapes, Pittsburgh mills	3.25	3.25	3.275	2.775
Shapes, Chicago mills	3.25	3.25	3.25	2.775
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	2.98
Plates, Pittsburgh mills	3.40	3.40	3.50	2.925
Plates, Chicago mills	3.40	3.40	3.40	2.925
Plates, del. Philadelphia	3.5848	3.6348	3.7256	3.21
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.275	2.775
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.775
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.40	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.775
Bright basic, wire, Pittsburgh	4.15	4.15	4.255	3.725
Wire nails, Pittsburgh mills	5.15	5.15	5.525	5.125
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.70

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Rerolling billets, Pittsburgh	52.00	52.00	56.20	45.00
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal. † 1.50 lb coating.

Pig Iron

	June 18, 1949	May 1949	Mar. 1949	June 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$44.08
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern, del. Philadelphia	49.39	49.39	50.3002	42.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	43.58
No. 2 fdry., del. Philadelphia	49.89	49.89	50.8002	42.67
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	39.38	39.88	43.38	39.38
Southern No. 2 del. Cincinnati	45.43	45.93	49.43	45.09
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	58.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	170.20	151.15*

* F.o.b. cars Pittsburgh.

SCRAP

Heavy melt. steel, No. 1, Pittsburgh	$23.00	$23.25	$36.30	$40.25
Heavy melt. steel, No. 2, E. Pa.	17.50	19.56	29.80	39.00
Heavy melt. steel, No. 1, Chicago	21.50	21.50	33.30	39.25
Heavy melt. steel, No. 1 Valley	22.00	22.00	35.85	40.25
Heavy melt. steel, No. 1 Cleveland	18.50	18.50	34.10	39.75
Heavy melt. steel, No. 1, Buffalo	19.75	22.81	35.95	43.00
Rails for rerolling, Chicago	27.75	27.75	43.85	53.75
No. 1 cast, Chicago	25.50	27.50	39.20	68.38

COKE

Connellsville, beehive furnace	$13.50	$14.25	$14.50	$13.00
Connellsville, beehive foundry	16.25	16.75	17.00	15.22
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, nom.; offered at $65 per net ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65, Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $65-$70 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles. Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c, Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.25c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.35c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Struthers, O., Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4 .15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance, Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.65c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.00-4.50c, New Castle, Pa., Youngstown; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.25-4.45c, Detroit; 4.50c New Haven, Conn., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.85c, Wallingford, Conn.; 4.90c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.25-4.50c, New Castle, Pa.; 4.50c, Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Struthers, O., Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Struthers, O., Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Youngstown; 5.45c, Ecorse, Mich.; 5.65c, Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, Mo., Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, Los Angeles.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Struthers, O.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.75c, Kansas City Mo.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another, $4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo., 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind.; 111 Houston, freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 121, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ¾ x 6-in. and shorter	37 off
⅞-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅝-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
¾, ⅞, & 1 x 6-in. and shorter	35 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
7/16-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

For prices of stainless and tool steels please refer to June 13 issue, Page 135.

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½–	11–	1	46½–	30½–
	41½	13½		48½	33½
¼	37½–	13–	1¼	47–	31–
	39½	15½		49	34
⅜	34–	9½–	1½	47½–	31½–
	36	12½		49½	34½
½	41–	23½–	2	48–	32–
	43	26½		50	35
¾	44–	27½–	2½, 3..	48½–	32½–
	46	30½		50½	35½
			3½ & 4	44½	29

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	40½	25	38½	23	28–	12½–
					38½	23
2½	44½	29	41½	26	33½–	18–
					41½	26
3	44½	29	41½	26	36–	20½
					41½	26
3½&4	42½–	26–	43½	28	38½–	23–
	46½	31			43½	28
5 & 6	42½–	26–	43½	28	43½	28
	44½	29				
7	....	....	....	....	43½	27

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	12½	1¼	46–	32–
¼	38½	14½		48	33
⅜	35	11½	1½	46½–	32½–
½	40–	24½–		48½	33½
	42	25½	2	47–	33–
⅝	43–	28½–		49	34
	45	29½	2½ & 3.	47½–	33½–
1	45½–	31½–		49½	34½
	47½	32½	3½ & 4.	43½	28

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	24	37½	22	27–	11½–
					37½	22
2½	43½	28	40½	25	32½–	17
					40½	25
3	43½	28	40½	25	35–	19½–
					40½	25
3½-4	41½–	28½–	42½	27	37½–	22–
	45½	30			42½	27
5 & 6	41½–	28–	42½	27	42½	27
	43½	28½				
8	45½	29	44½	28	44½	28
10	45	28½	44	27½	44	27½
12	44	27½	43	26½	43	26½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lapp Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+59	+90	1¼	+22	+47½
½	+20	+47	1½	+15½	+40
¾	+10	+36	2	+ 7½	+31
1 and			2½-3	+ 5	+26½
1¼	+ 4	+27	4	List	+20½
1½	— 2	+23½	4½-8	+ 2	+22
2	— 2½	+23	9-12	+12	+31½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D.	B.W.	Seamless		Elec. Weld	
IN.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§Chicago, district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.50	53.00	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	47.00	47.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
‡Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$59.50		
6.51-7.00	60.50	9.01- 9.50	65.50
7.01-7.50	61.50	9.51-10.00	66.50
7.51-8.00	62.50	10.01-10.50	67.50
8.01-8.50	63.50	10.51-11.00	68.50
8.51-9.00	64.50	11.01-11.50	69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorous. F.o.b. furnace, Lyles, Tenn.....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Diam. (Inches)	Length (Inches)	Cents per lb, f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-14.00
Connellsville, foundry	16.00-16.50
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens, New England, del.‡	22.70
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens	20.20
Milwaukee, ovens	21.15
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective as of Oct. 1)	
Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars (Effective as of Oct. 25)	12.50
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.) Domestic dead-burned, ⅝" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton) Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)
Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic concentrates, contract	56.62% 16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%: Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H. R. Rds.	C. F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.00‡	6.51	7.15	5.82	...	5.77	6.56	8.68	5.53	5.90	7.36
New York(c'try)	5.80‡	6.31	6.95	5.62	...	5.57	6.36	8.48	5.33	5.70	7.16
Boston (city) ..	6.10‡	6.70**	7.16	5.80	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	5.95‡	6.55**	7.01	5.65	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.09	8.40	5.25	5.50	6.70
Phila. (c'try)..	5.65	6.24	6.63	5.40	...	5.40	5.94	8.25	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	7.06	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.91	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	6.05**	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85‡	5.90**	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.90	5.00	6.00	4.90	5.65	9.20††	4.90	5.05-5.10	6.55
Detroit (w'hse)	5.42	6.22[4]*	7.43	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.80-6.91	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.65-6.76	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city).	5.00-5.20‡	5.90[4]	7.00	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.85	4.85	6.52-6.68	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.18	5.18	6.82-7.01	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.15	6.15	6.55	5.15	...	5.15	6.83	...	5.15	5.30	7.62
Birm'ham(c'try)	5.00	6.00	6.40	5.00	...	5.00	6.68	...	5.00	5.15	7.47
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	8.20	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	8.05	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[3]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	9.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.30[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; ††as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.ob. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10 % C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5 for max 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, corload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50%Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5 per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr.) Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(*Please turn to Page* 178)

Copper Supplies Not Excessive

Fabricator warns of possible shortage later this year, although stocks of refined metal increase despite production curtailment. Zinc drops ½-cent to 9.00c, East St. Louis

New York—Despite a further ½-cent decline in copper to 16.50c, some members of the industry declare there is little surplus copper immediately available. Roger E. Gay, president, Bristol Brass Corp., Bristol, Conn., warns that the possibility of a renewed shortage in copper supply this year cannot be ignored.

Declaring there is no present need for the import tax of 2 cents a pound on copper, he pointed out that the stocks of copper now in existence are not much larger than those at the close of 1948, when the supply was considered inadequate. He attributed the recent break in prices to the sudden curtailment in demand by consumers who wished to reduce inventories, thereby reducing sales to less than production.

He pointed out that government security program requirements are running at the rate of 20,000 tons a month and that there are threats of another strike affecting mine output. He concludes that reimposition of the tax might lay the groundwork for another copper shortage later in the year.

Copper—Consolidated Coppermines Corp. will cut copper production by 50 per cent, effective June 30, because of the recent decline in the price of the metal. Production will be curtailed between 500 and 600 tons a month. All underground operations at its mines, located at Kimberly, Nev., will be suspended at the end of June. Open pit operations at the company's properties near Kimberly will be placed on a 5-day schedule instead of the former 6-day weekly basis.

At 16.50c, delivered Connecticut Valley, copper is 7 cents a pound below the postwar high of 23.50c which prevailed from early August, 1948, to Mar. 29, 1949.

Stocks of refined copper increased 51,947 tons during May to 128,441 tons, the highest level recorded since December, 1940. This reflects an increase of 4266 tons in production of refined copper while deliveries to customers dropped 43,568 tons to only 32,566 tons, the smallest recorded since June, 1938. No material improvement in shipments during the current month is expected. Production of crude copper from primary sources declined about 5000 tons to 70,946 tons while output from secondary sources dropped a similar amount to 10,607 tons.

Producers of copper and brass mill products, including copper wire, have reduced prices but they have not yet lowered them to the full extent of the decline in primary metals.

Zinc—Lack of consumer buying interest forced custom smelters to lower prices ½-cent further on June 15 to the basis of 9.00c, East St. Louis, for prime western. This move was followed by other leading sellers. Bulk of business is being transacted on the basis of average prices or "price on date of shipment." At the 9-cent level, zinc is now priced ¼-cent below the final OPA ceiling established in October, 1946, and it is only ¾-cent a pound above the wartime ceiling of 8.25c.

Lead—As postwar inventories of lead products are worked oĕ, lead manufacturers are bound to re-enter the market, but probably with more normal buying that we have had in the last three years, R. L. Ziegfeld, secretary, Lead Industries Association, said last week. Consumers displayed a renewal of buying interest last week with sales aggregating the largest volume since the original price break in March. Production in one western producing district is being curtailed by reducing the work week to 5 days from 6 days. St. Joseph Lead Co. will close its Herculaneum smelter on July 1 for repairs which will require from 40 to 60 days.

Tin—Reconstruction Finance Corp.'s allocations of tin for May dropped to 2296 tons from 2485 tons in April and 4374 tons in January and total receipts dropped to only 7238 tons from 11,364 tons in April. While smelter output increased to 3007 tons from 2851 tons, imports were lower at 4231 tons against 8513 tons in April. Stocks at the end of May totaled 30,550 tons, after transfer of about 5600 tons to the permanent stockpile, compared with 31,116 tons at the end of April.

Production of tin concentrates in Indonesia in May was the equivalent of 2617 tons of fine tin as follows: Banka, 1412 tons; Billiton, 928 tons; and Singkep, 277 tons. This compares with 2700 tons in April and 2463 tons in May, 1948.

Platinum—Platinum prices declined $3 an ounce, last week to $69 for bulk quantities and $72 for retail lots. This was the first change in the platinum price since Mar. 17 when it was lowered $6 an ounce. The metal has been available at concessions from the quotation of the leading refiner prior to the latest price reduction. Demand from the jewelry trade has been negligible for some time while buying by industrial users has been slow.

Aluminum Product Shipments

Washington — Shipments of aluminum wrought products totaled 106 million pounds in April, 16 per cent below the 125 million pounds shipped in March and 24 per cent under the 139 million pounds shipped in April, 1948, according to the Bureau of the Census. Shipments of aluminum wrought products in April reached the lowest point since August, 1947.

The decline in shipments from March to April was accounted for by the decline in plate, sheet, and strip which dropped to 73 million pounds in April from the 92 million pounds shipped in March. Shipments of rolled structural shapes, rod, bar, and wire amounted to 18.1 million pounds, 2 million pounds above the 16.1 million pounds shipped in March. Shipments of extruded shapes, tube blooms, and tubing dropped 2 million pounds to 13.7 million pounds in April. Shipments of powder, flake, and paste amounted to 902,000 pounds, a decrease from the 1.1 million pounds shipped in March.

Stockpiling Needs Reviewed

Washington—Munitions Board Nonferrous Metals Advisory Committee reports that production of lead, zinc, and bismuth should be adequate to supply industry needs and provide the government with stockpile requirements in the 1950 fiscal year, assuming the Government's requirements are substantially the same as those in the current fiscal year.

The Munitions Board view is that one of its main concerns in stockpiling is to keep supplies of the 69 strategic and critical materials in balance. Although stockpile items are in better supply than a year ago, and at lower prices, the Munitions Board has been delayed in its procurement program through lack of funds. Requested appropriations now pending in Congress will enable the Board to resume its stockpile buying.

Consensus of the industry representatives is that lead is readily available, and that the government can easily obtain as much as 200,000 tons a year. It was suggested that the government make its heaviest purchases in the first six months of fiscal 1950. Although lead consumption is averaging less per month than in the same period last year, it is expected to be heavier in the fall and deliveries of lead should be sought in the months before October so the impact on industry will be lessened.

Consensus of industry representatives is that availability of other nonferrous metals is as follows:

Bismuth: Domestic consumption, exports, and production, down somewhat from last year, but quantities available for stockpiling about the same as last year.

Zinc: Substantial quantities available for stockpiling; domestic supply may be affected by increasing demand for galvanized sheets required by farmers and others for storage of government-supported wheat. Demand may be less because of decreased steel consumption.

Cadmium: Dollar value of requirements is small in relation to other stockpile requirements, although cadmium is in short supply.

Antimony: No new antimony being mined and imports from Mexico sharply curtailed; the country faces a complete shortage of antimony production. Munitions Board representatives indicate that stockpile supplies are adequate for at least another year, but expressed interest in having production facilities available.

Industry members expressed interest in a report that lead, copper, and zinc production in western Germany is increasing and that if occupation officials approve requests to export, additional supplies would be available to the United States.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 16.50c, Conn. Valley; Lake, Nom., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.25-15.50c; 88-10-2 (No. 215) 23.50c; 80-10-10 (No. 305) 20.00c; No. 1 yellow (No. 405) 12.00-13.25c.

Zinc: Prime western 9.00c, brass special 9.25c, intermediate 9.50c, East St. Louis; high grade 10.00c, delivered.

Lead: Common 11.85c; chemical, nom.; corroding, 11.95c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75c; No. 12 foundry alloy (No. 2 grade) 14.25-14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75c; grade 2, 14.50-14.75c; grade 3, 13.50-13.75c; grade 4, 12.50-12.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $81-$84 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.
Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 30.68; yellow brass 27.77; commercial bronze, 95%, 30.68; 90%, 30.28; red brass, 85%, 29.36; 80%, 28.97; best quality, 28.85; nickel silver, 18%, 47.49; phosphor-bronze, grade A, 5%, 50.12.

Rods: Copper, hot rolled 26.53; cold drawn 27.78; yellow brass, free cutting, 22.31; commercial bronze, 95% 30.37; 90% 29.97; red brass 85% 29.05; 80% 28.66.

Seamless Tubing: Copper 30.72; yellow brass 30.78; commercial bronze 90% 32.94; red brass 85% 32.27; 80% 31.88.

Wire: Yellow brass 28.06; commercial bronze, 95% 30.97; 90% 30.57; red brass, 85% 29.65; 80% 29.26; best quality brass 28.85.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.80, l.c.l. 24.42½, c.l. 23.92½; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.47½, l.c.l. 26.22½; magnet, delivered, c.l. 28.00, 15,000 lb or more 28.25, l.c.l. 28.75.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and Bends: List price plus 45%.

ZINC

Sheets, 14.25c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 13.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 12.50c; over 12-in., 13.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May Avg..	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Apr. Avg..	21.774	15.017	14.085	103.000	17.000	38.500	40.000	71.500
June 1 ...	17.625	11.85	11.00	103.00	17.00	38.50	40.00	71.50
June 2-7 ..	17.625	11.85	10.75	103.00	17.00	38.50	40.00	71.50
June 8 ...	17.000	11.85	10.00	103.00	17.00	38.50	40.00	71.50
June 9-11 .	17.000	11.85	9.50	103.00	17.00	38.50	40.00	71.50
June 13-14.	16.500	11.85	9.50	103.00	17.00	38.50	40.00	71.50
June 15-16	16.500	11.85	9.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.
Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 23.84c; oval 27.84c; cast 26.37c.
Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.
Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.
Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.
Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.
Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.
Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.
Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.
Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.
Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.
Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.25	14.25	13.50
Yellow brass	11.75	11.50	10.87½
Commercial Bronze			
95%	13.37½	13.12½	12.62½
90%	13.12½	12.87½	12.37½
Red Brass			
85%	13.00	12.75	12.25
80%	12.75	12.50	12.00
Best Quality (71-80%)	12.75	12.50	12.00
Muntz Metal	11.00	10.75	10.25
Nickel, silver, 10%..	13.75	13.50	6.87½
Phos. bronze, A	16.12½	15.87½	14.87½
Naval brass	11.50	11.25	10.75
Manganese bronze ..	11.62½	11.37½	10.87½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 12.50, No. 2 copper 11.50, light copper 10.50, composition red brass 9.50-9.75, radiators 7.75, heavy yellow brass 6.75-7.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 12.50, No. 2 copper 11.50, light copper 10.50, refinery brass (60% copper), per dry copper content 10.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 10.75-11.00, No. 2 9.75-10.00, light copper 8.75-9.00, No. 1 composition red brass 8.00-8.25, No. 1 composition turnings 7.50-7.75, mixed brass turnings 5.00-5.25, new brass clippings 9.00-9.50; No. 1 brass rod turnings 7.00-7.25, light brass 5.00-5.25, heavy yellow brass 5.50-5.75, new brass rod ends 7.00-7.25, auto radiators, unsweated 5.50-5.75, cocks and faucets 7.25-7.50, brass pipe 7.50-7.75.

Lead: Heavy 7.00-7.50, battery plates 4.00-4.50, linotype and stereotype 10.25-10.50, electrotype 7.50-8.00, mixed babbitt 10.50-11.00, solder joints, 10.50-11.00.

Zinc: Old zinc 3.00-3.50, new die cast scrap 3.00-3.50, old die cast scrap 2.00.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00, siphon tops 44.00-46.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 6.00-6.50, crankcase 6.00-6.50, borings and turnings 3.00-3.50, pistons, free of struts, 6.00-6.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.....	$23.00
No. 2 Heavy Melt.....	21.00
No. 1 Busheling.....	21.00
No. 1 Bundles.....	23.00
No. 2 Bundles.....	19.00-19.50
No. 3 Bundles.....	18.00-18.50
Heavy Turnings	17.50-18.00
Machine Shop Turnings	14.50-15.50‡
Mixed Borings, Turnings	14.50-15.50‡
Short Shovel Turnings.	18.00-18.50
Cast Iron Borings.....	18.00-18.50
Bar Crops and Plate..	23.00-23.50
Low Phos. Steel.....	23.00-23.50

Cast Iron Grades†

No. 1 Cupola Cast....	22.50-23.50
No. 1 Machinery Cast.	27.50-28.00
Charging Box Cast....	25.00-26.00
Heavy Breakable Cast.	24.00-24.50
Brake Shoe	25.00-25.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00
Axles	27.00-27.50
Rails, Random Lengths	25.50-26.50*
Rails, 2 ft and under..	29.00-30.00
Rails, 18 in. and under	30.00-31.00
Railroad Specialties ...	26.50-27.50
Angles, Splice Bars....	29.00-30.00

*Brokers' buying prices.
†Offering price.
‡Crushers buying prices.

CLEVELAND

Heavy Melt. Steel.....	$18.00-19.00
No. 1 Busheling.....	18.00-19.00
No. 2 Bundles.....	16.00-17.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	17.50-18.00
Short Shovel Turnings.	17.50-18.00
Cast Iron Borings.....	17.50-18.00
Bar Crops and Plate...	19.50-20.50†
Punchings & Plate Scrap	19.50-20.50†
Cut Structurals	20.50-21.50†

Cast Iron Grades†

No. 1 Cupola.....	27.00-28.00
Charging Box Cast....	22.00-23.00
Stove Plate	21.00-22.00
Heavy Breakable Cast.	19.00-20.00
Unstripped Motor Blocks	18.00-19.00
Malleable	21.00-22.00
Brake Shoes	20.00-20.50
Clean Auto Cast.....	30.00-30.50
No. 1 Wheels.....	25.00-26.00
Burnt Cast	18.00-19.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	23.50-24.50
R.R. Malleable	22.00-23.00†
Rails, 3 ft and under.	29.00-30.00
Rails, Random Lengths	26.00-27.00
Cast Steel	28.00
Railroad Specialties ...	28.00
Uncut Tires	24.00
Angles, Splice Bars....	29.00

† Nominal.

VALLEY

Heavy Melt. Steel	$22.00†
No. 1 Bundles.....	22.00†
No. 2 Bundles.....	19.00†
Machine Shop Turnings	13.50-14.00†
Short Shovel Turnings.	18.50-19.00†
Cast Iron Borings.....	18.50-19.00†
Low Phos.	23.00-23.50†

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00-25.00

† Nominal.

MANSFIELD

Machine Shop Turnings	$13.50-14.00†
Short Shovel Turnings.	17.50-18.00†

† Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$19.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling.....	18.00
No. 1 Bundles.....	19.00
No. 2 Bundles.....	17.00
Machine Shop Turnings	8.00
Mixed Borings, Turnings	8.00
Short Shovel Turnings.	8.00
Cast Iron Borings.....	9.00

Cast Iron Grades

No. 1 Cupola Cast....	27.00
Charging Box Cast....	21.00
Heavy Breakable Cast.	18.00
Stove Plate	15.00
Unstripped Motor Blocks	15.00
Brake Shoes	15.00
Clean Auto Cast	27.00
Drop Broken Cast	30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
R.R. Malleable	17.00
Rails, Rerolling	21.00
Rails, Random Lengths	19.00
Rails, 18 in. and under	30.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles.....	$15.50-16.00
No. 2 Bundles.....	12.00-12.50
No. 2 Heavy Melt. Steel	12.50-13.00
No. 1 Busheling.....	15.50-16.00
Machine Shop Turnings	9.50-10.00
Mixed Borings, Turnings	9.50-10.00
Short Shovel Turnings.	10.50-11.00
Cast Iron Borings.....	10.50-11.00
Punchings & Plate Scrap	15.50-16.00

Cast Iron Grades

No. 1 Cupola Cast....	20.00-21.00
Heavy Breakable Cast.	16.00-17.00
Clean Auto Cast.....	20.00-21.00

BUFFALO

No. 1 Heavy Melt. Steel	$19.50-20.00
No. 2 Heavy Melt. Steel	17.50-18.00
No. 1 Bundles.....	17.50-18.00
No. 1 Bushelings.....	17.50-18.00
No. 2 Bundles.....	15.50-16.00
Machine Shop Turnings	11.50-12.00
Mixed Borings, Turnings	15.00-15.50
Cast Iron Borings.....	15.00-15.50
Short Shovelings	15.50-16.00
Low Phos.	21.00-21.50

Cast Iron Grades

No. 1 Cupola Cast....	24.00-25.00
Heavy Breakable.....	21.00-21.50
Malleable	22.00-22.50
Clean Auto Cast.....	26.00-26.50

Railroad Scrap

Rails, 3 ft. and under.	29.00-30.00
Scrap rails	25.00-25.50
Rail Specialties	27.00-28.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$19.00-19.50
No. 2 Heavy Melt. Steel	17.50
No. 1 Busheling.....	17.50
No. 1 Bundles.....	19.00-19.50
No. 2 Bundles.....	15.50
Machine Shop Turnings	11.00-11.50
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings.	13.00-14.00
Bar Crop and Plate...	22.00-23.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles.	19.00-19.50
Heavy Turnings	19.00-19.50
No. 1 Chemical Borings.	Nom.

Cast Iron Grades

No. 1 Cupola Cast....	25.00
No. 1 Machinery Cast.	28.00
Charging Box Cast....	24.00-25.00
Heavy Breakable Cast.	24.00-25.00
Unstripped Motor Blocks	19.00-20.00
Clean Auto Cast.....	28.00
No. 1 Wheels.....	27.00-28.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$12.50-13.00
No. 2 Heavy Melt. Steel	11.00
No. 1 Busheling.....	11.00
No. 1 Bundles.....	12.50-13.00
No. 2 Bundles.....	10.00-10.50
No. 3 Bundles.....	nominal
Machine Shop Turnings	5.00-7.00
Mixed Borings, Turnings	5.00-6.00
Short Shovel Turnings.	7.00-8.00
Punchings & Plate Scrap	17.00
Cut Structurals	nominal
Elec. Furnace Bundles.	17.00

Cast Iron Grades

No. 1 Cupola Cast.....	20.00-21.00
No. 1 Machinery.....	21.00-22.00
Charging Box Cast....	18.00-18.50
Heavy Breakable	18.00-18.50
Unstripped Motor Blocks	nom.
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$13.00-13.50
No. 2 Heavy Melt. Steel	10.50-11.50
No. 1 Bundles.....	12.00-13.00
No. 1 Busheling.....	9.50-10.00
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings.	9.00-9.50
Bar Crops and Plate..	14.00-15.00
Punchings & Plate Scrap	14.00-15.00
Chemical Borings	10.50-11.00

Cast Iron Grades

No. 1 Cupola Cast.....	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast.	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
No. 1 Bundles.....	21.00-22.00
No. 2 Bundles.....	17.00-18.00
No. 3 Bundles.....	14.00-15.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	15.00-16.00
Cast Iron Borings.....	14.00-15.00
Bar Crops and Plate..	22.00-23.00
Punchings	22.00-23.00
Elec. Furnace Bundles.	21.50-22.50
Heavy Turnings	19.50-20.50
Cut Structurals	22.00-23.00

Cast Iron Grades

No. 1 Cupola Cast....	27.00-28.00
Clean Auto Cast.....	27.00-28.00
No. 1 Wheels.....	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00-23.00
Malleable	22.00-23.00
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under.	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties ..	24.00-25.00
Angles, Splice Bars....	24.00-25.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$19.00-20.00
No. 2 Heavy Melt. Steel	17.00-18.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings.	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast....	25.00-26.00
Charging Box Cast....	20.00-22.00
Heavy Breakable Cast.	19.00-20.00
Brake Shoes	21.00-22.00
Clean Auto Cast.....	28.00-29.00
Burnt Cast	20.00-21.00

Railroad Scrap

R.R. Malleable	21.00-23.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under.	26.00-27.00
Uncut Tires	19.00-20.00
Angles, Splice Bars...	26.00-27.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	18.00
No. 2 Bundles	16.00
No. 3 Bundles	14.00
Machine Shop Turnings	14.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	15.00
Cast Iron Borings.....	15.00
Bar Crops and Plate..	25.00-26.00
Cut Structurals	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast.....	33.00-34.00
Stove Plate	30.00-31.00
No. 1 Wheels.....	30.00-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	nominal
Rails, Rerolling	30.00-32.00
Rails, 3 ft. and under.	31.00-32.00
Angles and Splice Bars	31.00-32.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles....	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast....	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings.....	17.00
Nos. 1 & 2 Bundles...	15.00
No. 3 Bundles.....	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	20.00
Cut Structurals	20.00

Cast Iron Grades

No. 1 Cupola Cast.....	23.00
Heavy Breakable Cast.	19.50
Stove Plate	18.00
Unstripped Motor Blocks	18.00
Malleable	23.00
Brake Shoes	23.00
Clean Auto Cast.....	23.00
No. 1 Wheels.....	23.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	22.00
Rails, Random Lengths	22.00
Angles and Splice Bars	22.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles...	16.00
No. 3 Bundles.....	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	28.00

Cast Iron Grades

No. 1 Cupola Cast....	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

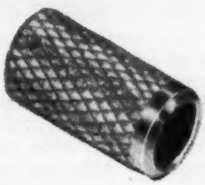
(Ceiling prices, delivered)

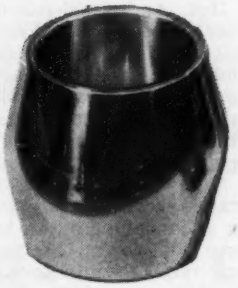
Heavy Melt.	$23.00
No. 1 Bundles.....	23.00
Mechanical Bundles....	21.00
Mixed Steel Scrap.....	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	18.00
Short Steel Turnings...	17.00

Cast Iron Grades*

No. 1 Cast.....	48.00
No. 2 Cast.....	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.





To produce many thousands of cast bronze bearings day after day, to the uniformly high quality synonymous with the name Bunting requires precise foundry control. This control starts with the raw materials necessary for production such as molding and core materials, core binders, fixed carbon fuel, prealloyed metal in ingot form purchased to Bunting's own rigid specifications, and virgin metals used for ladle additions to control metal composition. Then, too, melting and casting procedures are carefully controlled for the following reasons:

1. To keep gas absorption during melting to a minimum, thus assuring sound, gas-free castings.
2. To effect complete deoxidation of the metal in the ladle before pouring.
3. To insure that each particular casting is poured at the precise metal temperature consistent with highest quality.
4. To insure that molding and core materials are so processed that the correct properties are obtained for good castings, and
5. To insure metal of uniform composition meeting the specification.

Trained foundry and laboratory personnel are required to carry on this exact control as well as chemical and metallurgical equipment of the latest design. Bunting has always taken pride in being the leading producer of bearing bronze of the highest quality and has the facilities to maintain this leadership. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in principal cities.

86

Bunting®

BRONZE BEARINGS

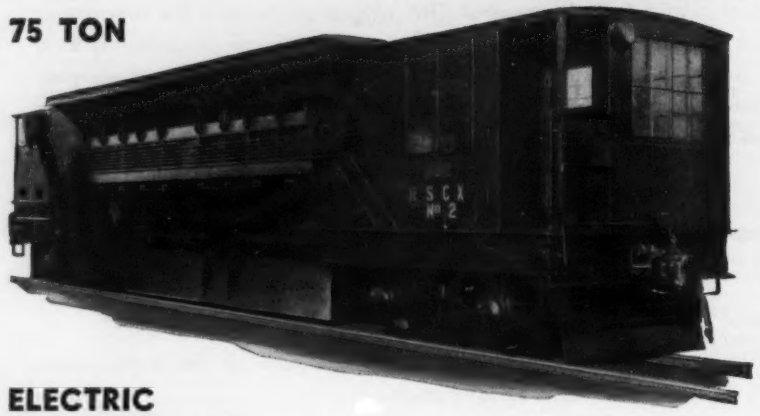
BUSHINGS

PRECISION BRONZE BARS

ATLAS

ENGINEERS CAN SOLVE YOUR INTRA-PLANT HAULING PROBLEMS

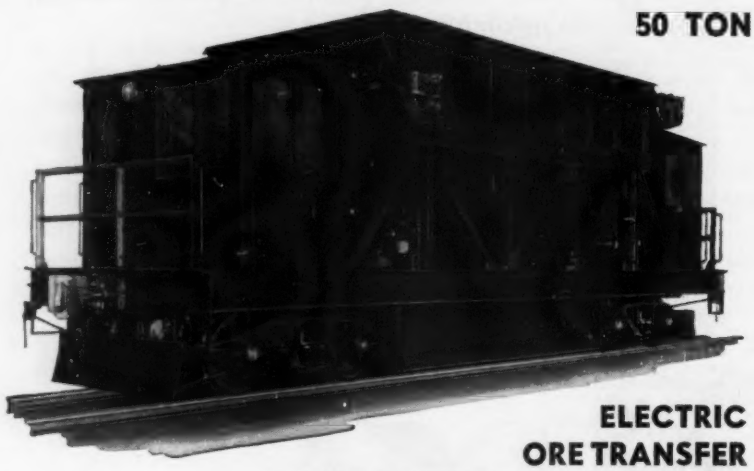
75 TON



ELECTRIC
TRANSFER CAR
GABLE BOTTOM

Car built in two sections with independently operated discharge gates for either side of track. Car has self-aligning journal bearings, electric heaters and is propelled with two 75-HP motors. Equipped with air brakes, sanders and standard safety equipment.

50 TON



ELECTRIC
ORE TRANSFER
GABLE BOTTOM SIDE DUMP

Car has single discharge gates on either side, operated pneumatically. Trucks have self-aligning journal bearings each mounting a 75-HP motor. Car equipped with air brakes and other standard safety equipment.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1140 IVANHOE RD CLEVELAND 10 OHIO U S A

Sheets Strip . . .

Sheet Prices, Page 154

Grain bin requirements contribute to stringency in galvanized steel

Washington—Removal of export quota restrictions from transformer grade electrical sheets leaves galvanized sheet metal, tin and terne plate, and iron and steel scrap as the only iron and steel products which now remain under quantitative export restrictions. OIT removed export quotas because of improvement in the domestic supply.

Philadelphia—Apart from galvanized sheets, light flat products generally are in fairly good supply. One large producer will enter the new quarter with some arrearages in cold sheets, but in the main supply and demand are getting in balance. Some sellers of galvanized sheets believe they will be caught up by August. Grain bin requirements, currently set up under the voluntary allocation program at 8000 tons monthly, contribute somewhat to the stringency in galvanized, but with producers having an annual capacity of around 2.8 million tons, or little more than 233,000 tons a month, these needs should not count heavily as general requirements become filled. In fact, disposition of government officials to tighten the licensing of galvanized sheets for export, rather than ease it, because of fear of jeopardizing the grain bin program, has caused adverse comment in some trade quarters.

Bethlehem Steel Co. has dropped its bar mill band prices $5 a ton to 3.25c, Johnstown, Pa., competitive with hot strip. The Alan Wood Steel Co., Conshohocken, Pa., has reduced hot sheets to 3.35c, mill.

Coating extras on galvanized sheets have been reduced in line with the further decline in zinc prices, resulting in an average cut of about $1.50 a ton on this product.

Pittsburgh—Revision of Order M-43 permits manufacturers to sell long terne sheets with a coating of 8 pounds or less per double base box for any end use except the following: Advertising specialties; art objects; Britannia metal, pewter metal, or other similar tin bearing alloys; buckles, buttons; emblems and insignia. Permission also is granted to supply long terne sheets, 20-pound coating, for smoke pipe elbows and fittings, roofing gutters, down spouts, and fixtures for same; also 12-pound coating for fuel tanks for automotive equipment, hot water heaters, flue jacket lines, and other parts exposed to flame or hot flue gases.

Hot and cold-rolled sheet producers are much less optimistic about full third-quarter production schedules than was the case less than a month ago. July rollings in most instances are fully specified, but beyond that date there are many openings in schedules.

New York—Sheet producers generally are keeping galvanized sheets on a consumer quota basis, but they may let down the barriers as the new quarter gets under way. There is still an active demand for the

over $100,000,000 for Rustproofing
Tuna clipper being sprayed with zinc. Portable spraying equipment in foreground. Courtesy Metallizing Engineering Co., Inc., Long Island City, N. Y.
(above) A rack of electrogalvanized conduit just removed from zinc electroplating tank. Courtesy The National Supply Co., Pittsburgh, Pa.
(below) Drum containing screws being loaded into gas-heated sherardizing furnace for tumbling in zinc vapor atmosphere. Courtesy Zinc Development Association, Oxford, England.
Hot-dip galvanizing line showing control station and zinc-coated sheets emerging from pot in left background. Courtesy U. S. Steel Corp.
TIME . . . unrelenting proving ground—has firmly established the superiority of zinc as a protective coating for iron and steel. The largest single peacetime use of zinc is in the form of metallic coatings. In 1948, for example, more than 45% of the metallic zinc consumed in the United States, or 365,000 tons costing approximately $102,500,000, was used for this purpose. This does not include the amount of the metal used as zinc dust, zinc oxide, lithopone and other zinc pigments in paints, and it is safe to say that about half of the entire production of zinc is used for protecting other materials, but notably iron and steel. In order of tonnage of zinc consumed in their production, hot dipped coatings stand first, followed by electroplated, sherardized and sprayed coatings. Considering that for economical and mechanical reasons the protective zinc coating is relatively thin, it can readily be appreciated that the tonnage and dollar value of iron and steel products thus rustproofed annually is practically incalculable.
HIGH GRADE
INTERMEDIATE
ST. JOE
Electro Thermic
ZINC
BRASS SPECIAL
PRIME WESTERN
ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK 17, N.Y. • ELdorado 5-3200

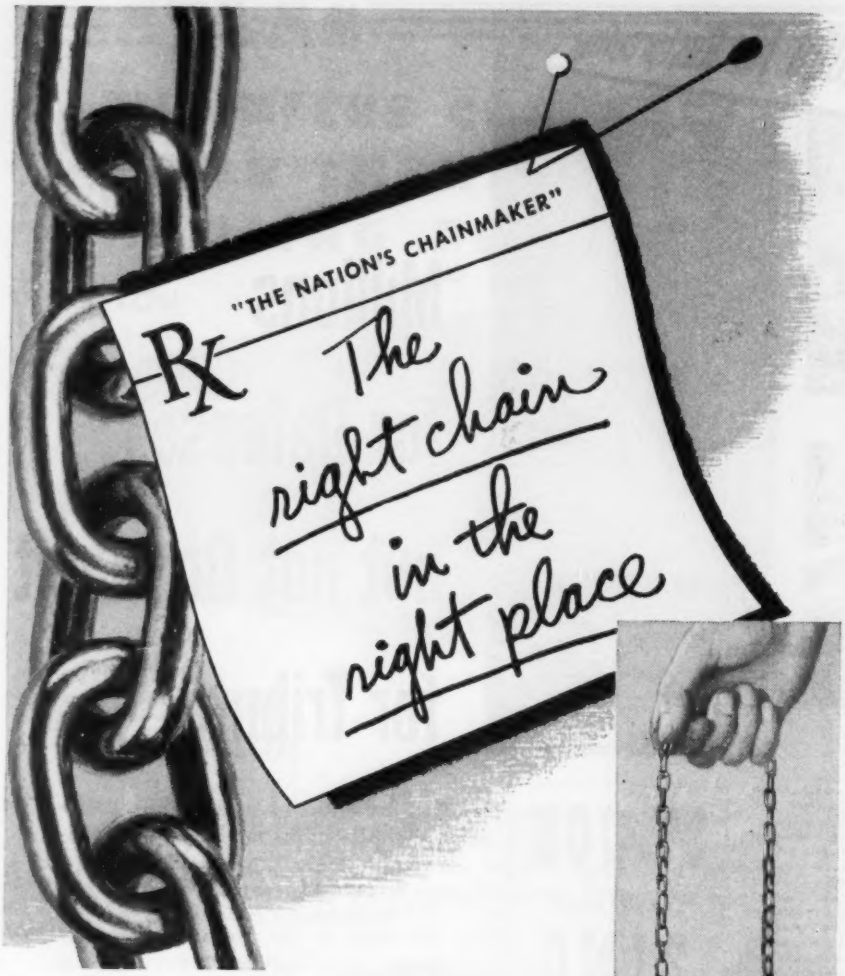
"Millions for Defense but not One Cent for Tribute"

* *Made by Charles Cotesworth Pinkney, U. S. Minister to France in 1796, in reply to the French Government's demand for a "loan"—in reality for a gift—in return for which Murat offered to prevail upon the pirates harbored in French-dominated North African ports to cease the hijacking of U. S. merchant ships in those coastal waters.*

This famous statement * could well be adopted as a slogan by producers of galvanized iron and steel products. As pointed out in the advertisement reproduced above in miniature, over $100,000,000 worth of zinc was used in 1948 to coat iron and steel products in order to minimize the tribute exacted annually by the elements in the form of rust and corrosion.

"ST. JOE Electro-Thermic ZINC and GALVANIZING" is a new 16-page, 8½x11" illustrated booklet containing reprints of six St. Joseph Lead Company advertisements covering the various zinc coating methods employed today: Hot dip galvanizing, electrogalvanizing, sherardizing and spraying. Additional data of interest to producers and fabricators of zinc coated iron and steel products have also been included. Copies of this booklet are available upon request to companies in these industries.

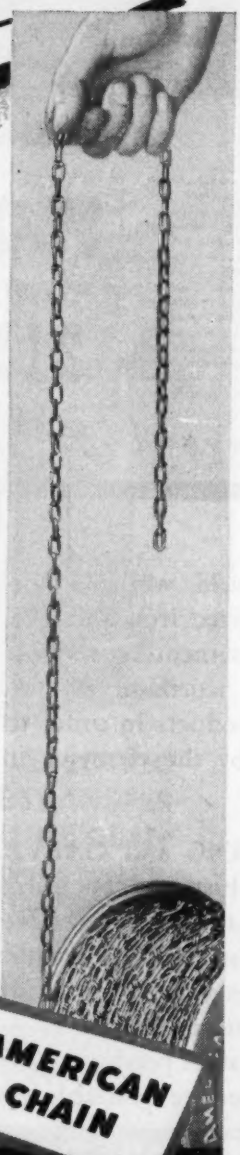
ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK 17, N.Y. • *ELdorado 5-3200*



Here at York, we do not think of chain-making as merely a matter of producing tonnage. To offer a line of products as complete as the AMERICAN CHAIN line requires an intimate knowledge of chain design, the best use of alloys, proper heat-treating, galvanizing—plus the necessary machinery and equipment to take full advantage of that knowledge.

AMERICAN makes chain in sizes from that of a ship's anchor chain to that of a fish stringer. But size is only part of the story. A wide selection of patterns, material analyses and finishes—as well as a complete range of fittings and attachments—makes AMERICAN truly the

"COMPLETE CHAIN LINE"



York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

coated product. Certain producers are also keeping long ternes on a consumer quota basis.

In some quarters there is at least a pretense of maintaining quotas on cold-rolled sheets, but to all practical intents and purposes supply is unrestricted. This applies very definitely to hot sheets and numerous specialties.

Boston—Among flat-rolled products cold-rolled carbon sheet schedules are in strongest position to start third quarter; for July most mills are filled, but commitments beyond are limited. Cold strip buying still lags and mills, having dipped deep into backlogs, have less tonnage to fill openings. Specialties, notably electrical and enameling stock, are slow. As with other finished steel products, lead-time scheduling is more elastic and considerable part of limited spot buying is frequently on delivery basis.

Cincinnati—Buyers of sheets continue cautious, as disclosed in refusal to enter future commitments. However, immediate demand for cold-rolled and galvanized is in excess of output, with needs for hot-rolled just about covered. It is becoming difficult to fill schedules on specialties.

Chicago—Drying up of new business is accelerating. One steel producer's volume of new orders dipped very sharply last week with three short-term factors cited as the cause: (1) Uncertainties over the labor negotiations; (2) expectation of lower steel prices; (3) vacation periods just ahead. Much more serious than the momentary lack of new business with this interest, however, is the high rate at which cancellations are being received, washing out to a considerable degree the heavy backlogs which have been instrumental in holding up this company's ingot rate. On the other hand, another producer will go into next quarter with a carryover averaging two weeks or more on most of its carbon steel products and expects there to be little letup in demand through August.

Birmingham—Emphasis continues to be on sheets in this district since demand from a widely scattered list of users over the southeast does not seem to taper off to any extent. Considerable tonnage is composed of roofing sheets at this season, but demand for manufacturers' sheets holds up exceedingly well.

Los Angeles—Although demand for flat-rolled products has been holding steady for a month, inquiries have increased noticeably. Much of this, however, is from small fabricators who are seeking distress tonnages at reduced prices. Mill offerings from eastern sources are larger than at any time in the past several years.

St. Louis—Sheet demand remains level, although production is off more than 50 per cent because of local slab mill repairs. This district's ingot production rate dropped to 66 per cent when Granite City Steel Co. cut off half its furnace capacity for the repair period—probably a month. Sheet order books are filled and producers anticipate "no worries before August." Steel salesmen, however, report a disposition to postpone ordering as long as rumors of impending price cuts are afloat.

Plates . . .

Plate Prices, Page 155

Philadelphia — District plate mill operations over the next few weeks will reach the lowest level in a number of years, due to a combination of factors: declining business, vacations and repairs. Lukens Steel Co., Coatesville, Pa., beginning June 19, will suspend operations for two weeks for repairs to its 120-inch mill, with resulting suspension also of its 110-inch breakdown mill. Employees in these mills will take their vacations during this period. The company's 206-inch mill is scheduled for electrification later in the year, or as soon as necessary equipment is available. Consequently, no early suspension of this mill, or of the 140-inch breakdown mill, is scheduled at this time.

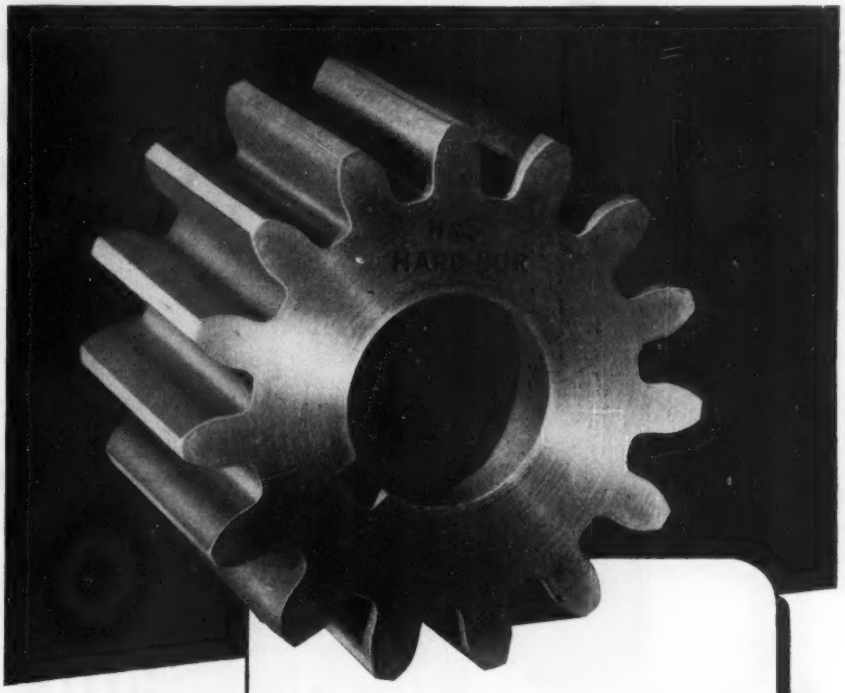
Worth Steel Co., Claymont, Del., beginning July 1, plans to shut down the larger of its two mills for a week and the smaller for two weeks. Alan Wood Steel Co., Conshohocken, Pa., will close down its plate mills for two weeks for vacations, beginning July 11. Its sheet mill is scheduled to go down for vacations some time in August. To become more fully competitive, this latter producer has reduced its high strength, low alloy plates $2 a ton to 5.20c mill, and the Claymont producer has lowered its price on carbon steel for processing in its flange shop $1 to 3.40c, mill.

New York—Voluntary plate allocations, as set up for July and possibly to continue on through September, represent a drop on a monthly basis of more than 50 per cent from a few months ago, as the new monthly rate calls for approximately 95,500 tons against 210,600 tons. The drop reflects particularly the elimination of freight car allocations, although the decline is cushioned somewhat by the new ECA program, involving 24,150 tons a month.

However, noncertified as well as certified requirements are continuing to decline, with producers generally well caught up on arrearages and cutting down on their production.

Lukens Steel Co., Coatesville, Pa., is closing down its 120-inch 4-high plate mill for repairs, effective June 19. Vacations will be allotted during the period of suspension. The suspension also will affect the company's 112-inch mill which serves as a break-down unit for the 120-inch mill. Two other eastern plate mills are planning to close down around the end of the month, for vacations.

Boston—Some plate producers are confronted with a new selling job in this territory, if their share of prewar tonnage is to be regained. Premium prices, selective selling, freight payments by consumers, voluntary allocations and other factors, playing havoc with long established customer relationships, have for several years concentrated distribution of light tank plates heavily between two producers. This grade plate constitutes bulk of tonnage here. Return to delivered basing point policy of selling would tend to stabilize the situation as far as New England is concerned. New orders are slow and are frequently limited to small fill-in orders; several eastern mills can come into



HARD-DUR GEARS

by Horsburgh & Scott

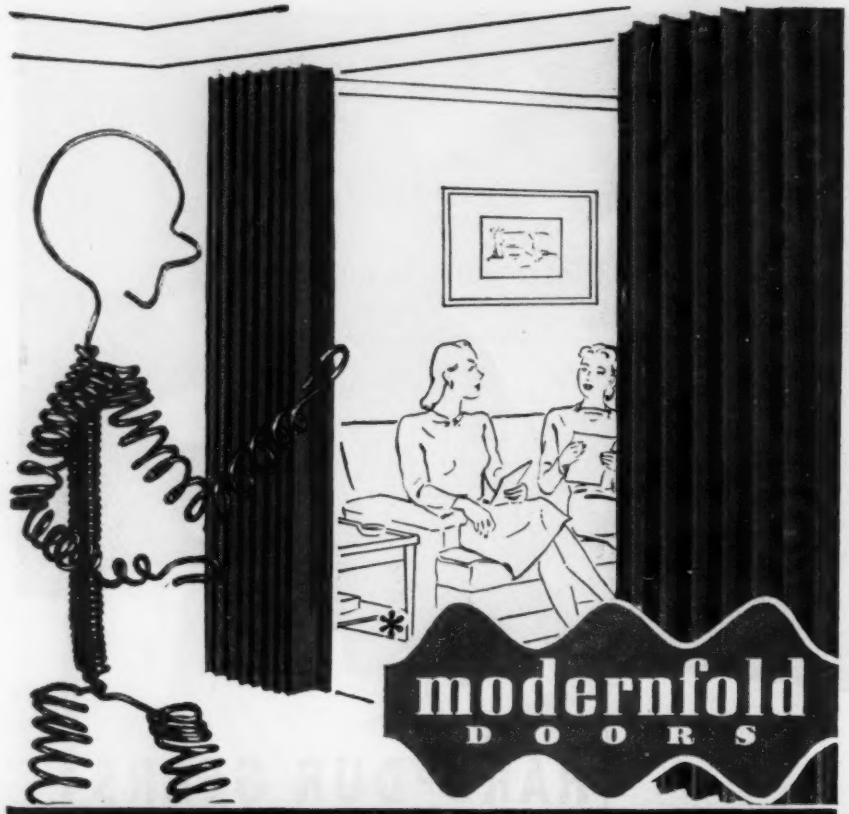
give 5 times the life and . . . at only 30% extra in cost. HARD-DUR Gears preserve the tooth form because they are made of the finest gear steels and are scientifically heat treated. They handle the tough jobs on which ordinary gears fail . . . a trial will prove that it's easier with HAR-DUR.

Send note on Company Letterhead for 488-Page Catalog 41

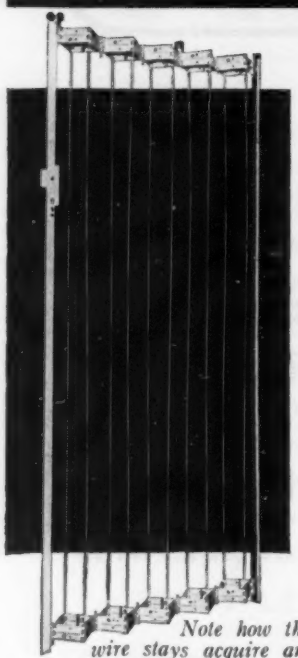
THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.



made with
KEYSTONE WIRE



Modernfold Doors are a revolutionary type of folding wall . . . with a smooth, trouble-free, accordion-like operation.

A framework of vertical stays made of Keystone galvanized wire forms a firm foundation to which colorful fabrics are attached. The wire stays give added strength and rigidity to the accordion-like construction and play an important part in the patented hinge-action at top and bottom.

Modernfold Doors are the work of master craftsmen. All materials used in their construction are rigidly tested . . . with special emphasis on quality. That's why rust-resisting Keystone galvanized wire is specified.

Keystone wire is a recognized factor in the unique and practical construction of these modern closures.

Note how the Keystone wire stays acquire an accordion-like action from the precision-built hinge-plate.

** New Castle Products* *New Castle, Ind.*

KEYSTONE
MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE
for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

New England by truck with loads around 23,000 pounds under the current freight from mills.

Birmingham—Even with the frantic pressure definitely off, plates remain in active demand in the South. Diversion of large tonnages to the recently completed tube mill at Gadsden has been a major factor in sustaining demand while a spurt in ship repair work at Mobile also is accounting for some new plate tonnage.

Seattle—While plate fabricators report a fair run of small jobs, several projects requiring sizable tonnages are set for the immediate future.

For the McNary dam cofferdam, bids July 19, about 14,900 tons steel piling will be required and for a breakwater at Nome, Alaska, about 1500 tons of similar material will be needed; both are government engineer jobs.

Structural Shapes . . .

Structural Shape Prices, Page 155

New York—Due primarily to public work, structural demand is holding at the rate which has prevailed over the last several weeks. Public work is comprised principally of bridges, schools and miscellaneous buildings of civic and state character. Competition among fabricators is increasingly keen, although no sharp breaks in prices are recorded. Meanwhile, most shape producers are caught up on back orders, with a result that fabricators are having no difficulty in getting specifications required in a reasonably short period.

Boston — Competitive bidding for fabricated structural steel frequently brings out prices at half former peak levels with delivery promised as low as four weeks; district shops are drawing on inventory and taking losses on material. Where sizes are not available, mill deliveries are prompt with producers building inventories; wide flanged beams are an exception. With more steel available, several states, buying directly on small bridge requirements, again are including structural material in contractors' specifications.

Philadelphia—Structural business is becoming increasingy competitive, with only one outstanding award reported in this district—a 1700-ton apartment here. Inquiry is spotty. A few fabricators have backlogs of four and five months, but these are well above average. Shape mills are caught up on arrearages.

Chicago—A substantial part of the business sought by fabricators is for small jobs requiring less than 100 tons of steel. This type of work generally is of the hurry-up variety where delivery is of primary importance. A few fabricators who are well booked with heavy-tonnage projects shy away from these jobs, but an increasing number of fabricators are bidding on them. Fabrication of one size of locomotive underframes, which have previously been farmed out in the district, is being recalled to the builder's own shops, leaving some capacity open.

Seattle — Structural plants have good order backlogs which will carry to the fourth quarter. Construction projects are calling for a large tonnage in small individual contracts.

Tubular Goods . . .

Tubular Goods Prices, Page 155

Pittsburgh—Spang-Chalfant Division of National Supply Co. and Jones & Laughlin Steel Corp. have reduced galvanized pipe prices $2 per ton, or one point higher discount, retroactive to May 24, in line with action initiated by National Tube Co. Similar price action has been taken by Mercer Tube Co. and Pittsburgh Tube Co., effective as of June 14 and 13, respectively. Fretz Moon Co. increased its discounts, effective June 13, one-half point, or $2 lower price, on sizes ⅛ and ¼-inch, and one point higher discount on size ⅜-inch.

A. M. Byers Co. had not announced any revisions in its wrought iron galvanized pipe prices up to late last week.

Cleveland—Republic Steel Corp. increased its discounts on galvanized pipe one point, or $2 a net ton, effective June 10. The new discounts are based on 11-cent zinc. Republic's pipe mill at Youngstown will be closed from July 1 through July 17 for vacation.

Easing in demand for steel is beginning to be felt by pipe producers. Some line pipe projects have been suspended, and jobbers of merchant pipe are showing signs of having sufficient inventories.

Boosts in railroad freight rates have spurred an increasing number of buyers to request their pipe shipments to be made by motor truck. This is causing some concern among producers whose pipe mills are set up primarily for loading of railroad cars.

Birmingham—A 400-ton barge of mixed steel pipe from Pittsburgh was unloaded and sorted at the TVA terminal at Guntersville, Ala., last week. It was the first load of steel pipe to move to Guntersville by water and went to firms in Birmingham and Atlanta.

St. Louis—Pipe remains the tightest item in this district's steel picture. Mills are booked through third quarter and continue to be what they call "highly discriminating" on orders past that period. One producer terms the demand "wonderful," but doubts it will escape eventually the fate of other softening steel products. Pressure is attributed mainly to the plumbing supply industry and a recent new pickup in oil field demand.

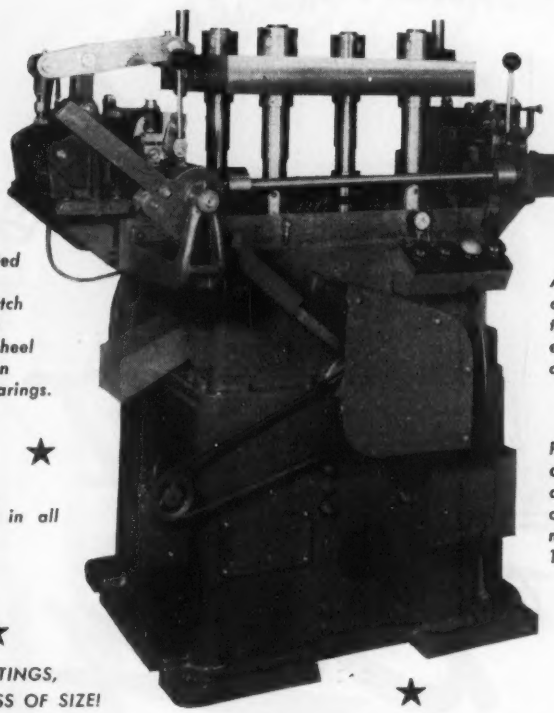
Oakland, Calif.—Kaiser Co. Inc.'s price schedule for continuous weld standard steel pipe, effective as of May 12, showed the following discounts from list prices for T. & C. black pipe, mill lengths, 40,000 pounds or more, f.o.b. Fontana, Calif.: ½-in., 32; ¾-in., 35; 1 in., 37½; 1¼ in., 38; 1½ in., 38½; 2 in., 39; 2½ and 3 in., 39½; 3½ and 4 in., 33½. Galvanized pipe takes a 14½ discount on ½-in., 18½ on ¾-in., and 17 on 3½ and 4 in.; discounts on other sizes are 16 points below discounts for comparable sizes of black pipe.

Los Angeles—Demand for small diameter pipe has perked up in recent weeks, with most of the betterment coming from the oil industry. Most of the producers have restored normal drilling programs, and reinstituted equipment improvement plans.

Presenting some of the reasons why plants using BRANDES PRESSES enjoy cost reduction through continuous high production, longer runs between grinds, longer die life and sturdier dies.

Simply check a few of these features, translate them into terms of cold efficiency, and then ask yourself if you can afford to neglect checking up on our claims.

BRANDES 30-TON AUTOMATIC PRESS



★ Larger bed area, 20" x 31".

★ *Conventional working height.*

★ *Air operated disc type friction clutch and brake with fly wheel mounted on Timken Bearings.*

★ *Air counterbalance and low center of gravity eliminates slap and vibration.*

★ *Automatic lubrication in all machines.*

★ *Precision double roll feed and rigid scrap cutter for material up to 10" in width*

★ *NO GROUTINGS, REGARDLESS OF SIZE! This exclusive feature of the Brandes Press brings savings on special foundations. Press is easily moved and installed because there are no moving parts or projections under the base.*

★ *Multiple V ways with long guiding surface, permitting greater off-center loading, longer die life and more accurate alignment.*

BRANDES PRESSES have been in production in a number of America's greatest plants during the past ten years. They are designed and built to represent a solid investment, and one of our greatest sales points is the fact that they pay continuous dividends. If you care to forward blueprints or parts scheduled for progressive die work, we will be pleased to submit estimates on production speed, etc. There are many ways in which Brandes 30-750 TON PRESSES can reduce your costs. Let us tell you about them, may we?

THE BRANDES PRESS CO.

6408 EUCLID AVE., CLEVELAND 3, O.

Wire . . .

Wire Prices, Page 155

Boston—Third quarter bookings of high carbon specialties are slow with July openings reported on numerous products; finishing operations slowed down ahead of vacation periods and small spring shops are on curtailed schedules. Automobile industry demand holds up better than average and commitments on valve spring wire are generally maintained. Heading wire and wire used by textile industry are slack and deferments from screw manufacturers include considerable early third quarter volume.

India Supply Mission has awarded a contract for 16,880,000 feet of galvanized strand to the Paulsen-Webber Cordage Corp., New York. The 2000-ton order will permit 600 more miles in India's program of national electrification.

Pittsburgh—Downward trend in demand for manufacturers' wire items continues more pronounced than for merchant trade products. Inventories reported by consumers of furniture spring wire and similar items remain excessive in most instances, reflecting curtailed production schedules.

Jones & Laughlin Steel Corp. reduced galvanizing extras on nails 35 cents per hundred pounds, effective June 10, in line with action adopted by other producers.

Sound design and highest quality materials combine to make Bailey Thermal Expansion Valves dependable under all conditions. Hundreds of steel mills are getting safe, dependable service from them. Expansion of steel tubes when steam is passed through, frees the goggle plate. When steam is removed, contraction of the tubes closes the flanges against the goggle plate. In an emergency, if steam pressure should fail, the Valve is easily operated by a hand wrench. For service in hot dirty-gas mains, use the improved heavy-duty type. Made in diameters of 72 to 120 inches.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA.

Cleveland—Demand for merchant wire products has been holding up fairly well but a decline in third quarter would not be surprising. Building nails of the most commonly used sizes still can be sold but it is necessary to do more looking among jobbers for buyers. Large size building nails are moving slowly. In particularly heavy demand are roofing nails, plaster board nails, and duplex (double-headed) nails.

Indicating farmers still are in good financial position, demand for woven wire fencing is holding up substantially compared with the lower-cost barb wire.

Helping one producer catch up on the merchant wire products demand is the decline in requirements of manufacturers' wire. The latter situation permits diversion of additional wire into merchant products.

Birmingham—Wire products, on the whole, are just about the only southern items which admittedly are "definitely easier." However, there is no real surplus of any item in wire except on a momentary basis. More wire products are reaching the rural sections in the form of nails and fencing, but there is not too much in stock.

Birmingham—Tennessee Coal, Iron & Railroad Co. has reduced extras for hot galvanized wire nails 35 cents per 100 pounds. The new extra is $2.45 per 100 pounds in carload lots and $2.70 in less than carlots.

Los Angeles—Reflecting recent reductions in the price of zinc, Columbia Steel Co. has reduced the extra for hot galvanizing wire nails 35 cents per 100 lb. The new galvanizing extra is $2.45 per 100 lb. in carloads and $2.70 in less than carloads, Pittsburg, Calif., plant.

Steel Bars . . .

Bar Prices, Page 154

New York—Hot and cold carbon bar demand continues to lag, with specifications next month expected to be adversely affected by suspensions at a number of consuming plants for the observance of mass vacations. A number of these plants will be down for at least two weeks. The vacation influence also will be reflected in August at which time there will be various other suspensions. Bar producers, as a result, will restrict production further over the next two months. Most sellers, however, anticipate some pickup in the late summer or early fall, as they believe that excess stocks in many consuming plants will have been reduced to a point where new buying might be warranted.

Bliss & Laughlin Inc., Buffalo, has the contract for 2085 tons of steel rounds at $250,160 for Chicago procurement office, Corps of Engineers.

Boston—Carbon bar users still can buy for July delivery. Cold finishing operations have slipped further and some mills have built up inventories, including sizes and grades which were extremely tight earlier this year. Larger users generally have cut back or revised orders for July, extending part of the volume beyond that month as they work off inventory. Warehouses are on a buyers' strike

as far as bars are concerned. Crucible Steel Co. of America was low on approximately 760 tons of alloys bid at the Watertown arsenal recently. Material is reported to be for export.

Philadelphia—Hot carbon bar demand continues to slip, especially now that most jobbers are well caught up on their needs and are no longer cushioning the general decline. Some buyers are now complaining they are getting shipments too far ahead of schedule. Meanwhile, bar consumers are laying plans for suspensions of a week to two weeks for vacations, most of them to fall early in July and quite a few in August.

Sheffield Revises Price List

Kansas City, Mo.—Effective June 13, new prices on its complete range of products were put into effect by Sheffield Steel Corp. at its Houston, Tex., mill. Under the new schedule f.o.b. mill prices are as follows:

Hot-rolled carbon bars, 3.75c; reinforcing bars for fabricators, 3.75c; hot-rolled sheets, 18 gage and heavier, 3.65c; hot-rolled strip, 6-in. and narrower, 3.65c; carbon plates, 3.80c; structural shapes, 3.65c; nails and staples to dealers, column 111.

Sheffield, on May 4, changed its f.o.b. Kansas City prices for major products to the following:

Hot-rolled carbon bars, 3.95c; reinforcing bars for fabricators, 3.95c; hot-rolled strip, 6 in. and narrower, 3.85c; structural shapes, 3.85c; bright basic wire, 4.75c.

At present the company has not published its current prices on hot rolled sheets or plates at Kansas City.

May Decontrol Canadian Steel

Ottawa—Government control over steel prices in Canada is expected to be removed before the end of 1949. A review of the domestic steel situation and a study of the steel and coal production prospects in the United States will be undertaken soon. If it is determined that shortages in coal and steel in the United States are unlikely, decontrol will be ordered.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 154

New York — Municipal housing work features demand for reinforcing steel, with one project, involving 3000 tons recently placed; another, involving 2600 tons, actively pending. Reinforcing steel generally is in somewhat better supply and, while demand is less pressing, a fairly substantial amount of tonnage is being booked.

Boston—As more semifinished steel becomes available to reinforcing bar mills, distributors supplies are getting into balance; decline in inquiry is also a contributing factor. Connecticut highways and bridges account for leading tonnages in public works, some projects specifying spiral steel bars.

Dallas — Demand for reinforcing bars is holding firm in this area, bolstered chiefly by a continuation of building activity and large public works projects, the latter mainly Texas highway department awards totaling $6 million to $10 million a month. Fabricators are getting sufficient supplies of bars to meet consumer orders.

Seattle—Local steel production is down, due to closure of Northwest Steel Rolling Mills Inc. by a wage dispute. Negotiations are progressing.

Demand for reinforcing bars continues strong and estimating staffs are working overtime. Small jobs predominate but several sizable projects, principally public works, are pending.

Bethlehem Pacific Coast Steel Corp. mill maintains full capacity and is accepting new business about equal to production. Merchant bars are not in active demand.

Tin Plate . . .

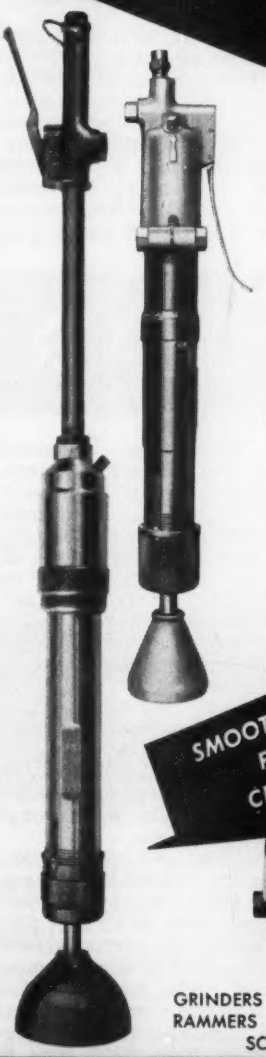
Tin Plate Prices, Page 155

Pittsburgh—Recent revision of tin control orders permits tin plate producers to sell excess hot-dipped primes or seconds for any end use specified under Order M-43 or where 0.50-pound is specified in M-81. Excess electrolytic primes or seconds can now be sold for any end use. Most sellers report July production schedules fully specified, but are less optimistic about production prospects over remainder of the third quarter. Customers' inventories are in much better balance than at any time in the postwar period, while mills' stocks have been augmented considerably.

UNIFORM MOLDS COST LESS WHEN YOU USE

CLECO RAMMERS

FOR FASTER PRODUCTION OF HIGH QUALITY CASTINGS



The Cleco "Wafer" Valve provides the piston with a fast action and powerful penetration that saves production time and assures uniform molds.

The Cleco Throttle Valve provides the operator with a "feather" touch. Cleco Rammers are well balanced for easy handling.

The wiper ring construction of the piston rod packing excludes dirt and, with a built-in lubrication system, assures long trouble-free service.

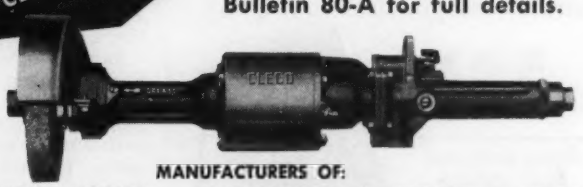
There is a Cleco Rammer for every job. A wide variety of sizes for both floor and bench types is available.

Write for your free copy of Bulletin 76-B for full details.

SMOOTH UP CASTINGS FASTER WITH CLECO GRINDERS

Cleco manufactures a complete line of superior horizontal and vertical grinders.

Write for your free copy of Bulletin 80-A for full details.



MANUFACTURERS OF:

GRINDERS • SANDERS • ROTARY DRILLS • RIVETERS • SAND RAMMERS • CHIPPERS • SCALING TOOLS • IMPACT WRENCHES SCREWDRIVERS • HOSE FITTINGS • SUMP PUMPS

CLECO DIVISION

of the REED ROLLER BIT COMPANY

P. O. BOX 2119, HOUSTON, TEXAS, U.S.A.

PROPER DESIGN– still the most important ingredient

Despite the great advances in the use of alloy steels, the shape and proportions of a part are still of more vital significance than its material.

In an overall view, we should rate Design (1), the choice of the proper Steel (2), and its Treatment (3), in that order of importance. All are, of course, matters of great concern, but if the design is wrong then the proper choice of steel and its successful treatment serve no useful purpose.

What is the metallurgical significance of poor design? It promotes unhealthy stress concentrations and troublesome variations in the proportions of adjacent parts.

To stress the relationship of good design to metallurgical and economic factors, we have prepared a book helpful to designers, showing by sketches a great many factors in good and poor design which influence the behavior of a part in service.

Climax Molybdenum Company

500 Fifth Avenue
New York City

Please send your
FREE BOOKLET
3 KEYS TO SATISFACTION

Name.....
Position.....
Company.....
Address.....

MOLY

S-6 FIB

Pig Iron . . .

Pig Iron Prices, Page 156

Pittsburgh—Jobbing foundry operations here show no sign of improvement; most shops are either closed or operating on two to three-day per week basis. Foundries producing plumbing ware fixtures have been shut down for the past six to eight weeks because of excess inventories of finished products. Considerable progress has been made in working down these inventories and there is some prospect that production for replacement purposes will be necessary later this summer. Lack of merchant iron demand has enabled lone foundry iron producer to substantially augment inventories, which will make possible blowing out of its furnace for repair sometime this summer.

Lack of orders has forced Carnegie-Illinois Steel Corp. to blow out its third blast furnace at Duquesne Works.

New York—Continued drop in demand for pig iron is likely over the next few weeks, especially with various plants closing down for summer vacations.

Certain additional merchant producers, anticipating this situation and already piling a fairly substantial amount of iron, are expected to either bank or blow out within the near future. Some would have suspended before this had it not been for desirability of building up stocks in expectation of labor disturbances this summer in coal and possibly in steel.

Alan Wood Steel Co., Swedeland, Pa., blew out the smaller of its two stacks June 15, as buying is light and a substantial quantity of iron has been piled to meet customers' needs for some weeks. The furnace may not be placed in operation again until September, or early fall.

Boston — With most merchant stacks piling iron, including Mystic, conjecture is rife as to how much tonnage will be stocked at current prices; at $52.50 per ton for foundry iron, 20,000 tons piled represents an inventory in excess of $1 million. On July 1, 1941, this grade was $25, Everett, and $24 Buffalo, roughly indicating that a ton of iron piled today represents double the inventory value eight years ago. June iron shipments will be lowest in years with slight improvement indicated for July, although some foundries will resume limited deliveries. By Aug. 1, bulk of high-cost foreign iron will have been liquidated, although there will be exceptions.

Buffalo—Pig iron and coke production were heading toward lower levels in the local area. Hanna Furnace expects to shut down one of its four active units before the current month ends. Republic Steel is also planning to pare output. The Donner-Hanna Coke Corp., which is owned by Hanna Furnace and Republic, cut daily production of coke from 3200 tons to 2800 tons. The Hanna furnace will be withdrawn partly because of a slackening in business and partly for relining. Falling scrap prices and increased supplies have also lessened the demand for basic iron. Meanwhile, foundries continue to complain

The New
XACTLINE
STRAIGHT LINE TEMPERATURE CONTROL
For Use With Pyrometer Controllers

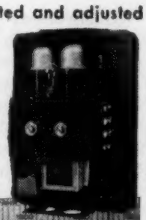
Anticipates Temperature Change Eliminates Overshoot and Undershoot

Now with XACTLINE Straight Line Temperature Control you can increase the efficiency of your Pyrometer Control Instruments (either Millivoltmeter or Potentiometer Type) to an amazing degree. Now you can hold tolerances as close as 1/5°F. plus or minus and power "on-off" cycles as low as 3 seconds.

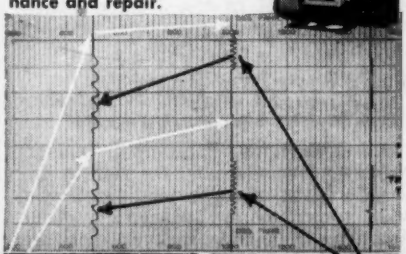
For XACTLINE, operating in the thermocouple circuit, ANTICIPATES the most minute heat variations on both heating and cooling cycles, thereby enabling your pyrometer controller to control far more closely than otherwise possible.

This *Anticipation Factor* means that XACTLINE causes the conventional pyrometer controller to respond to a millivoltage impulse up to 90% less than that normally required, (the controlling pyrometer functions *only* when the desired temperature range has *already been exceeded*).

XACTLINE is laboratory tested and adjusted . . . does not require readjustment or coordination with other controllers.



NO gears, cams, shafts, bearings or other rotating or sliding parts. Simple design eliminates usual maintenance and repair.



PRECISE CONTROL FOR . . . Tempering-Drawing . . . Iso-Thermal Quenching . . . Al and Mg Treatment . . . Accurate Heat Treating . . . Sintering . . . Metallic Baths . . . Plastic Molding . . . and other operations . . . Price complete F. O. B. Factory . . . **$79.50**

Write for the new XACTLINE data folder today!

GORDON SERVICE

CLAUD S. GORDON CO.

Specialists for 33 Years in the Heat Treating and Temperature Control Field

Dept. 14 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 14 • 7016 Euclid Avenue • Cleveland 3, Ohio

about a falling off in orders.

Cleveland—No substantial increase in demand here for merchant pig iron can be expected before Sept. 1. Foundries are operating at 30 per cent of capacity and at this rate have an average of 60 days' supply of iron. In view of the general decline in business and the customary summer lull there is little likelihood that foundries will have any occasion to step up their rate of operations before September.

Republic Steel Corp. still has two of its five blast furnaces out of production here.

Cincinnati—A number of district foundries have announced vacations June 24 to July 5, indicating further cuts in pig iron shipments. The coal miners' holidays, even with threats that they may be prolonged, have not altered melters' desire to hold inventories of iron to a minimum. Current ordering is in minimum tonnages for immediate requirements.

Chicago—Although furnace operations hold unchanged with 39 in blast out of 43 in the district, the sales problem in merchant iron is becoming more pronounced as the normally slack foundry season begins. Some users have figured their consumption so closely as to be entirely out when their scheduled vacations begin. If this situation is true among a great number of melters, a sudden upswing in demand can be expected within the next two months. Possibly this expectation is the main support to the present rate of merchant iron production.

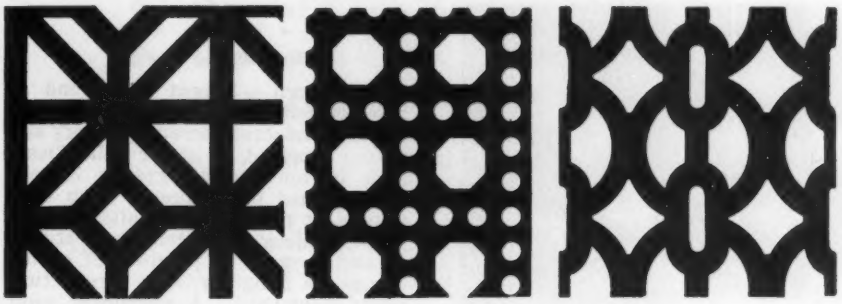
Birmingham—Merchant iron interests report slight improvement in pig iron demand during the last few weeks. Some iron is being stockpiled, but with one Republic furnace being leisurely repaired, the situation is not too bad. Conditions likely will improve as soon as large inventories are worked off.

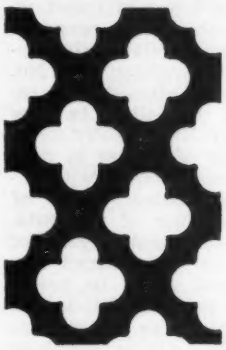
St. Louis—Pig iron production has dropped 5 per cent further to about 55 per cent of capacity. Even at this rate, blast furnace stockpiles are growing. Coke production is 67 to 68 per cent of capacity. In anticipation of the mine shutdown, local furnaces stocked sufficient coal for 60 days at capacity operations or 110 days at present rate. In addition, 25 days' supply of coke is on hand.

Seattle — Ample offerings of pig iron are being made in this area, but demand has dropped in proportion to foundry activity which does not exceed 60 per cent of capacity. Prices are unchanged.

Bethlehem Output Still High

Bethlehem, Pa.—Bethlehem Steel Co.'s operations are still being maintained at a high level, although a few hundred men have been laid off at the local mills. Actually, it is understood, there have been about 500 furloughed since the first of the year, most of them within the last few weeks. Up to the present time, interdepartmental switches have kept lay-offs at a minimum. While a number of the smaller steel producers are planning to suspend operations for stated periods this summer for mass vacations, the Bethlehem company has no such program in prospect.





Ornamental perforated metal

Hendrick offers a wide variety of decorative patterns in light weight perforated metal, for radiator enclosures, stove panels, kitchen cabinets, and similar applications.

Regularly furnished in steel sheets of available stock size, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

EUCLID *Cranes*

THE REPEATED CHOICE of LEADERS in the HEAVY INDUSTRIES

STANDARD MODELS MEET OVER 90% OF YOUR REQUIREMENTS

For many successive years, Euclid Cranes have fulfilled the most rigid material handling requirements of long established heavy industries.

Proved performance with long trouble-free service has resulted in standardization and repeat orders. 1/2 to 100 tons capacity. Spans up to 100 ft. Write for literature.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

1364 CHARDON ROAD • EUCLID, OHIO

Scrap . . .

Scrap Prices, Page 160

Pittsburgh — Recent downtrend in steel output has strengthened the already satisfactory scrap inventory situation reported by major mills. Dealings in open-hearth grades largely are confined to purchases from customers at published quotations. Buying of dealers' scrap remains restricted and there is no prospect of an increase as long as steel production tends downward. A significant drop of $2 in low phos scrap is noted on small lot sales within price range of $23-$23.50. The price relationship between No. 1 heavy melting and No. 1 busheling has been altered with result that No. 1 busheling is now quoted on par with No. 2 heavy melting steel. Further weakness in railroad specialty items is noted with recent sales within price range of $26.50-$27.50, a decline of 50 cents.

Philadelphia — Actual buying of steel mill scrap in this district has reached the lowest point in years. Certain leading brokers no longer have steel mill business under contract. Meanwhile, prices continue nominally lower, with the market being established more on a basis of what sellers are offering rather than on actual sales. This is particularly true in the major grades of steel mill scrap. In some of the minor grades prices have been set up on carlot orders which normally would be regarded as of little significance.

No. 1 heavy melting steel and No. 1 bundles are now holding nominally at $19-$19.50, delivered, No. 2 heavy melting and No. 1 busheling at $17.50, and No. 2 bundles at $15.50. While mixed borings and turnings are unchanged, machine shop turnings have dropped to $11-$11.50 delivered, and bar crop and plate, punchings and plate scrap and cut structurals to $22-$23. Electric furnace bundles and heavy turnings are off nominally to $19-$19.50.

No. 1 cupola cast is holding at $25, delivered, but No. 1 machinery and clean auto cast are off slightly to $28, and No. 1 cast wheels to $27-$28. Charging box and heavy breakable cast are steady at $24-$25 and unstripped motor blocks at $19-$20.

Boston — Open-hearth scrap prices are lower with all grades easier and demand light; for Pittsburgh $11.50 f.o.b. shipping point is offered, but pressure is on that price from other directions. Turnings and borings are weak at $4.50-$5, shipping point. Yards are taking in a small volume of scrap at present prices. Cast iron grades move only in small truck or carlots and prices are weak.

New York—Scrap trading is at a virtual standstill, with brokers buying prices off nominally on several of the steel grades. No. 1 heavy melting steel and No. 1 bundles are now $12.50-$13, f.o.b. shipping point; No. 2 steel and No. 1 busheling $11 and No. 2 bundles $10-$10.50. Punchings and plate scrap and electric furnace bundles have been reduced to $17. Turnings and the major cast grades are unchanged.

Buffalo—Prices slipped an additional $1 to $1.50 in the scrap market during the week. Sales were not large, but were indicative of a market as dealers showed a willingness to sell at the lower figures. Prices on No. 2 heavy melting and related items declined to $17.50-$18.00. Machine shop turnings plunged to $11.50-$12.00. Short shovelings remained at $15.50-$16.00. This item is now being used in open-hearth charging by one mill which heretofore used No. 1 heavy melting almost exclusively.

Dealers were showing considerable interest in reports that the Canadian government has cancelled all import permits for scrap shipments into Canada from this country, unless the scrap is enroute or already loaded. Shipments from the Eastern Seaboard into Canada, via the canal and local transfer to freight cars, continued heavy during the week.

Cleveland—Continued weakness in demand for open-hearth grades of scrap may force a drop next month in the price of blast furnace grades to restore the normal price spread between the two. Normally there is a spread of around $4, but currently it is only 50 cents to $1, leaving the price of blast furnace grades in what some dealers describe as an untenable position. The blast furnace grades in recent weeks have been the most active of all scrap in a dull market. Meanwhile, prices on all grades remain unchanged.

Detroit—A flurry of improved sentiment died quickly and prices have sagged again over the past two weeks. No. 2 bundles and heavy melting steel are off 50 cents a ton, while borings and turnings are down $2. Cast material weakened further by $3 a ton. The leading local mill had entered orders to buy a substantial tonnage of open-hearth scrap and overnight canceled the purchase, adding to the dark outlook.

Cincinnati — Scrap prices have slipped downward again, in a dull market. Mills would rather reduce than build up inventories and, hence, are drastically restricting shipments. Foundries are entering on vacation period, lack orders for castings, and restrict buying to immediate needs. Without shipping orders, dealers are wary of building their stocks at going prices.

Chicago—Most noteworthy development in another week virtually devoid of mill buying was the brokers' tendency to bypass dealers completely in filling old orders. Two scrap sources are being tapped almost exclusively for steel mill requirements —the railroads and factories which prepare their own material. It is not surprising, therefore, that yard dealers say brokers' offering prices and mill buying prices are far out of line with the dealers' offers. Last week one dealer offered to sell every pound of No. 2 heavy melting scrap in his yard for $15 a ton. The indicated other items could be obtained for correspondingly less than the last representative sales prices.

An encouraging sign in the cast iron scrap market was derived from orders placed by two major foundries last week at the prevailing price spread. Trade leaders see possibility of a price rebound, if several melters come back into the market at the same time. Other prices are nominal, the market test on steelmaking grades expected to come late this week when a major mill makes its

July purchases.

Birmingham—The scrap market here this week is dormant. Dealers don't have much in their yards, trucks bringing in only scattered small tonnages. Farm scrap is not in evidence. Heavy melting would not bring more than $18 and might be bought for less.

St. Louis—Scrap trading has come to a complete standstill here. Brokers find it extremely difficult to negotiate orders with foundries and there has been no mill buying since the first week of June. No more is expected till the end of the month. Country shipments of scrap have nearly dried up because of low prices.

Seattle — Receipts of steel scrap have increased as sellers are becoming reconciled to lower price levels. Last month the principal buyer here received as much as he used. Inventories are not being increased in view of future uncertainty. Bethlehem Pacific Coast Steel Corp. is paying $17 f.o.b. gross Seattle plant, absorbing 50 per cent of freight from outside points. The price mentioned is for both No. 1 and No. 2 heavy melting, as $2 is said to be insufficient to justify segregation.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 156

Pittsburgh—With leading consumers out of market a further reduction of $1 to price range of $13-$14 has occurred for beehive Connellsville furnace coke. Beehive coke operations were shutdown last week as result of strike at coal mines. Consumers' stocks are at exceptionally high levels, as reflected in action of one large interest stopping shipments three weeks ago. Despite continued lack of new buying from foundry interests, price levels for Connellsville beehive foundry coke have resisted pressure for lower quotations.

Philadelphia — District oven coke production is being cut rather substantially, more for the reason that demand is off and will likely continue off for some time and that stocks are in good shape, rather than because of any need for fuel conservation due to threat of a prolonged coal strike. Casting melt in July will drop to the lowest point in a number of years.

Galvanized Steel Needs Planned

Washington — Farm grain storage bin manufacturers are estimating needs of galvanized steel under government-backed grain storage program. Considerably more than 6000 tons monthly under the existing voluntary allocations program are indicated. The government-backed program falls under new Commodity Credit Corp. Charter Act.

The Commerce Department is not thinking of arranging a new voluntary allocations program in view of expiration of the law Sept. 30. If necessary, the department will call in the Steel Products Advisory Committee and urge that enlarged requirements be met on basis of individual negotiation between galvanized sheet producers and grain storage bin manufacturers.

▶ **Quality controlled products**
▶ **Increased production**
▶ **Reduced fuel costs**

. . . Features of F. E. I.'s Patented Combustion System

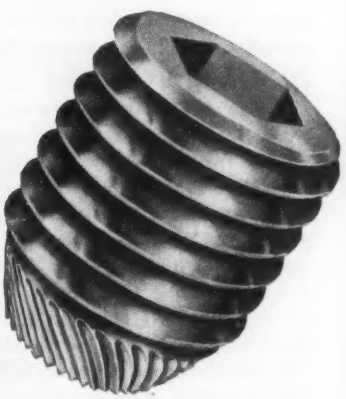
The F. E. I. patented combustion system provides uniform top and bottom temperatures by causing a double pass of the products of combustion around the inner covers before leaving the furnace, consequently eliminating the possibility of localized overheating. The F. E. I. system is completely automatic, providing maximum fuel burning capacity for high production demands, but at the same time permitting high turn down ratios for extended soaking periods.

The F. E. I. combustion system utilizes with equal efficiency the following types of gas: natural, coke oven, butane, oil refinery, clean producer and clean blast furnace.

FURNACE ENGINEERS, Inc.
1555 WEST LIBERTY AVE. · PITTSBURGH, PA.

UNBRAKO
Reg. U.S. Pat. Off.

SELF-LOCKING
SET SCREWS



Pat'd and Pats. Pend.

". . . they won't shake loose!"

Machine failure from any cause is expensive—in downtime, repair costs, lowered production, poor deliveries and loss of customer goodwill. Frequently such failure is caused by the loosening of set screws holding vital machine parts together.

UNBRAKO *Self-Locking* Set Screws won't shake loose! Their exclusive *knurling* makes them exceptionally vibration-resistant, prevents "creep" and subsequent loosening of the screws. They "stay put", even under the most chattering vibration.

UNBRAKO *Self-Locking* Set Screws can be real "Vibration Insurance" for your production machinery. And remember, they make an impressive selling point when you use them on your finished products.

Our folder 658-1 gives you further details. Write for yours today!

SPS STANDARD PRESSED STEEL CO.
BOX 579, JENKINTOWN, PENNSYLVANIA

"Serving Industry continuously since 1903 through Industrial Distributors"

ALL through the summer . . . through hot, humid days and hot, humid nights . . . the biggest thief in America will be raiding your plant, stealing your profits, stealing your steel!

In every department—where raw steel comes in, where steel parts are stamped or milled or machined or ground, where steel products are pickled or cleaned or assembled — the moisture in the air is always helping that big thief, RUST, to rob you of production—atom by atom—taking pennies and dimes and dollars out of your pocket.

But you don't have to put up with this monstrous moist-month thievery! The Oakite Technical Service Representative in your vicinity can help you fight RUST. He is well equipped with materials for (1) preventing rust, (2) removing rust, (3) cleaning and de-rusting in one operation and (4) simultaneously imparting rust-resistance and improving paint-adhesion.

FREE Phone your Oakite Technical Service Representative or write to Oakite Products, Inc., 34E Thames St., New York 6, N. Y., for full information on Oakite methods for arresting RUST in every part of your plant.

OAKITE

OAKITE 1909 1949 40

SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

Warehouse . . .

Warehouse Prices, Page 157

Philadelphia—Jobber prices on galvanized sheets have dropped another dollar a ton as a result of a further decline in zinc, with No. 10 gage now holding at 6.78c, city, and 6.63c, country. Cold-drawn bars have been established at lower levels, 6.09c, city, and 5.94c, country. Alloy prices are easy, with one large distributor in the process of marking prices down about $6 a ton, in line with recent reductions in certain other districts.

Jobbers report a continued decline in business and look for a still further shrinkage next month when many consuming plants will suspend for periods of from one to two weeks for vacations and even longer in certain cases because of poor business prospects. Incidentally, there will be no suspensions for mass vacations among the jobbers.

Boston—Steel distributors are cutting cloth to fit new sales patterns and are not buying products for which they were pressing mills earlier this year. Warehouse volume on mill books for third quarter is light with demand for steel out of warehouse declining. Price shading is more prevalent and there are scattered official reductions without stimulating volume.

Pittsburgh — Movement of steel from warehouse stocks continues relatively slow with customers remaining inventory conscious, particularly in view of the ready availability of steel at this time. Some consumers still anticipate a downward adjustment in prices for fourth quarter, despite possibility of increased cost developing out of the pending new wage contract. Steel distributors report best inventory position in postwar period, including wide flange beams, which until recently had been scarce.

Warehouse galvanized sheet prices remain unchanged at $6.90 for 10 gage base. Distributors here have so far resisted reducing cold-finished carbon bar prices in line with policy of warehouses in other districts.

Cleveland — Warehouses here are pushing vigorously for business. The only orders most of them get now are small, the larger ones going to the mills. However, this decline in size of orders is making a large volume of vital importance. Some distributors are achieving some of this volume through an improvement both in balance and quality of stocks.

Cincinnati — Sales of warehouse steel ever since the Memorial Day holiday have fallen below previous volume this year. With vacations in many fabricating plants looming, some interests foresee poorest tonnage this summer since the depression thirties. Coal mine interests have temporarily cut orders because of uncertain operations.

Chicago—While warehouse business remains good by prewar standards and several major items, primarily flat-rolled, are not plentiful in all gages, decline in new ordering continues without interruption.

Price of $6.85 per 100 pounds for No. 10 galvanized sheets is predicated on zinc at 9.50c, but by press time new sheet prices had not been put into effect by most distributors.

Birmingham—Warehouse prices for most items were adjusted slightly upward during the week. Stocks are gradually improving as demand for steel gets more nearly normal elsewhere. Warehouse demand is described as "moderately good."

Seattle—Jobbing houses report volume is steady, but slightly down from the April-May rate. Further recession may be expected during the summer. Stocks probably will be rounded out by August with easing of sheets and plates. Prices are steady and firm with adjustments for materials containing zinc in line with the lower price of that item. On June 8, Columbia Steel Corp. announced a reduction of 35 cents per 100 pounds on galvanized extras on wire nails, reflecting the change in zinc prices, the revised extra being $2.45 per cwt in car lots and $2.70 in less car lots.

Rails, Cars . . .

New York—Freight car demand is negligible, with no inquiries or orders reported. In fact, except for the placing of 200 hoppers by the Southern Railways late last month, there has been no outstanding buying in the east in several weeks.

Chicago—Cancellation last week by two railroads of a total of 3000 tons of rails, not to mention a full complement of tie plates, etc., from one mill points up the position with respect to proposed improvements which many roads now are in. Declining volume of rail business and mounting costs thus far this year has repeatedly made advisable the shelving of rail orders. Several freight car builders will exhaust their order backlogs in the next few months and face closure unless the ordering situation reverses.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 155

New York—While bolt and nut makers generally now have little more than about three weeks' backlog on an average, new business is at least fair. In fact, some makers actually report improvement. However, the overall trend is still down and probably will continue easy throughout the summer, as buyers' inventories remain in fairly good shape.

Shipments last month were good, although off from April, in the experience of most makers. Indications are that shipments this month will be still lower as makers restrict their operations. Certain bolt and nut plants have recently gone on a 35-hour week basis and expect to continue at this rate throughout the month.

To Suspend Mill Operations

BECAUSE of the inability of its Canton, O., hand mill to remain competitive with integrative steel producers, Superior Sheet Steel Division, Borg-Warner Corp., Chicago, will discontinue operations June 30. Company officials indicated continuous wide strip mills had made the plant's equipment obsolete. Difficulties were also experienced in getting lower priced sheet bars.

Wilson Sights Storm Signals

C. E. WILSON, president of General Motors Corp., addressing a group of GM dealers in Detroit last week, said storm signals were flying in various sections of the country. GM is assembling 12,500 cars and trucks daily and plans to hold this pace through August, possibly September. However, the moment dealers are not able to sell all cars being built, production will be trimmed. He saw the possibility of a steel strike by July 15.

Canada . . .

Toronto, Ont.—Production of steel ingots, nails, nickel and copper in Canada to the end of April, 1949, ran ahead of the high record for the corresponding period of 1948.

For the first four months this year, production of steel ingots totaled 1,072,200 net tons, compared with 1,007,600 tons for the similar period last year. For April, output was 260,300 tons, down from the 287,900 tons in March but up from the 254,300 tons in April, 1948. The daily average output for the first four months this year was 8943 tons compared with 8327 tons in the like period last year.

Output of wire nails for the first three months of this year totaled 21,200 net tons against 19,600 tons in the first quarter of 1948. During March this year, 7500 tons of nails were made compared with 6500 tons in February and 7100 tons in March, 1948. Shipments of nails in first quarter also increased, rising to 22,300 tons this year from 21,600 tons in 1948.

Production of new primary copper in the first quarter this year totaled 64,200 tons against 60,600 tons in the first quarter of 1948. For March, production amounted to 21,900 tons against 21,100 tons in March, 1948.

Nickel output for the first three months this year amounted to 34,600 tons compared with 30,900 tons for the corresponding quarter last year. For March, output amounted to 12,600 tons against 10,500 tons in March, 1948.

Stocks of ingot makers' nonferrous scrap metal at the end of February amounted to 2197 net tons compared with 1452 tons at the end of January. Stocks of secondary nonferrous ingots at the end of February amounted to 1705 tons against 1363 tons at the end of January. During February, 2620 tons of secondary nonferrous ingots were produced, while the amount used or sold was 2278 tons.

Truckers Threaten To Strike

THE STEEL and metalworking industries in Cleveland faced the handicap of a strike of 3500 truck drivers and dockmen June 20.

Near the deadline for the strike the prospects for averting the tieup were characterized as "very poor" by a spokesman for the employers. The strike would affect all Cleveland industries, except foods and meats.

The teamsters union local-AFL had rejected the employers' final offer of a 7½-cent hourly wage boost and six paid holidays. The union was demanding a 10-cent hourly wage increase and six paid holidays.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1717 tons, School House, Lane apartment, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa., through the Turner Construction Co.

1178 tons, bridge over Trinity river, Dallas county, Texas, to American Bridge Co., Pittsburgh.

375 tons, Public School No. 92, Brooklyn, N. Y., to Grand Iron Works Inc., New York.

950 tons, warehouse, First National Store Corp., East Providence, R. I., to Bethlehem Steel Co.; Gilbane Construction Co., Providence, general contractor.

315 tons, state bridge, Middletown, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Jones Construction Co., Willimantic, Conn., general contractor.

250 tons, Emerson street viaduct for Port of Seattle, to Leckenby Structural Co., Seattle; general contract to Henrik Valle Construction Co., Seattle, low $168,533.

185 tons, two state bridges, Little river, Seymour, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Mariani Construction Co., New Haven, general contractor.

175 tons, miscellaneous items, heating and power plant, Ladd Field, Alaska, to Independent Iron Works, Oakland, Cal.; general contract to Morrison-Knudsen and Peter Kiewit Sons Co., low joint bidders.

165 tons, Water street underpass, Mystic River Bridge Authority, Charlestown district, Boston, to Grossier & Shlager Iron Works, Somerville, Mass.; Coleman Construction Co., Boston, general contractor.

160 tons, state bridges, Pittsfield-Williamstown, Mass., to West End Iron Works, Cambridge, Mass.

150 tons, boiler house, municipal Boulevard Houses development, Brooklyn, to Schacht Steel Construction Co. Inc., New York.

150 tons, garage, Indianapolis, to Central States Bridge & Structural Co., Indianapolis.

130 tons, state bridges, Danbury and Beacon Falls, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Brunelle Construction Co., New Britain, general contractor.

100 tons, repairs to the old state capitol building, Olympia, Wash., to Isaacson Iron Works, Seattle.

100 tons National Guard equipment garages, to Leckenby Structural Steel Co., Seattle.

STRUCTURAL STEEL PENDING

1600 tons, steel arch bridge, Atomic Energy Commission, Los Alamos, N. Mex.; bids June 29, chief, contract bureau; also 240 tons, concrete reinforcing bars.

1000 tons, additions to General Hospital, Lancaster, Pa.; bids June 29.

820 tons, double leaf bascule span with nine fixed spans, South Branch Shrewsbury river, Sea Bright-Rumson, N. J.; bids July 7, state highway department, Trenton; also 35 tons machinery.

610 tons structures at McNary dam, Columbia river; bids to U. S. Engineer, Walla Walla, Wash., July 19.

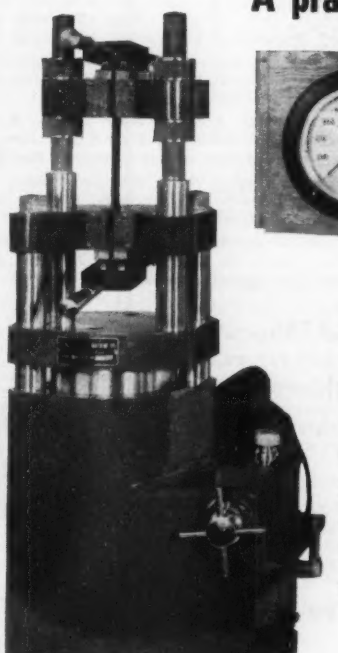
600 tons, warehouse, Owens-Corning-Fibreglas Co., Newark, O.; bids opened June 15.

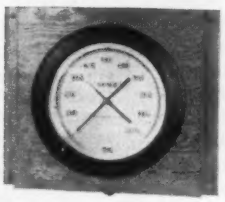
430 tons, superstructure, Penobscot river bridge, Chester-Lincoln, Me.; bids June 22, state highway commission, Augusta.

350 tons, switch gear testing station, General Electric Co., Philadelphia; bids in.

240 tons, also 25 tons reinforcing, Public Roads Administration bridges in Lewis

A practical **TENSILE TESTER**





FOR

Spotwelds, Strip, Wire, etc.

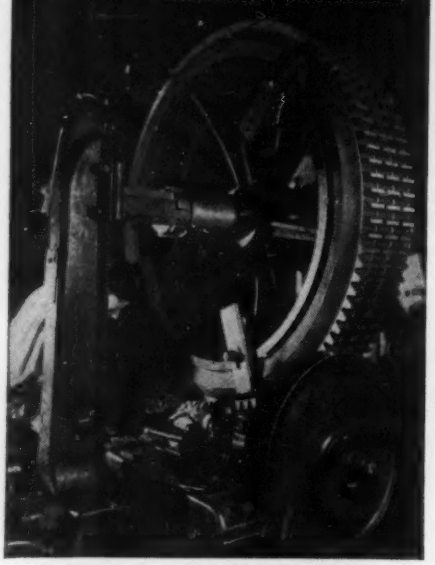
This compact, 34" high machine is simple, accurate and fast to operate in the testing of tensile strengths up to 20,000 pounds. . . . An easily-controlled ram with handy specimen grips and adjustable pulling members give this tester its ease and speed of operation. . . . Various load gauges and grips are available for specific requirements.

A Card or Letter Will Bring Descriptive Literature

DETROIT TESTING MACHINE CO.

9390 Grinnell Avenue • Detroit 13, Michigan

LARGE CUT GEARS



Cutting three identical spur gears simultaneously at Simonds Gear.

Cut Gears for Industrial Needs!

For special gears in larger sizes—exact duplicate gears for replacements—for every heavy-duty industrial gear application—look to SIMONDS GEAR where specialty gears for heavy industry have been a custom service for more than 50 years. Within easy shipping distance of many heavy industry plants—with a personalized service designed to meet your most exacting specifications—SIMONDS GEAR provides an unusually prompt and efficient service on even the most unusual gear requirements. Sizes range up to 145" dia. in all popular gear-making materials. Send your inquiry today and get acquainted with SIMONDS GEAR Service.

SPUR GEARS
BEVEL GEARS • MITRE GEARS
WORMS • WORM GEARS
RACKS • PINIONS

SIMONDS GEARS

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.

county, Washington, and Lane county, Oregon; bids to Portland, Oreg., June 21 and June 23, respectively.

200 tons, Admiral way bridge; bids in to Seattle June 15.

200 tons, state bridge, Sussex County, Del.; bids July 6.

130 tons, Pennsylvania Railroad bridge, Attica, O.; bids June 24.

120 tons, state bridge, Mercer County, N. J.; bids June 30.

120 tons, overpass, Greenwood avenue connection, route 26, Trenton, N. J.; bids June 30, state highway department, Trenton.

100 tons, laboratory building, Massachusetts Institute of Technology, Cambridge, Mass.

Unstated tonnage, aeronautical laboratory, Bureau of Yards & Docks, Trenton, N. J.; bids postponed until June 30.

Unstated, four story addition to Frederick & Nelson department store, Seattle, $6,250,000 project; John Graham, Seattle, architect; bids to be called in about four months.

Unstated, state bridge, Livingston, Mont.; general award to McLaughlin Construction Co., Livingston, low $410,108.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3000 tons, municipal Boulevard Houses development, Brooklyn, through Driscoll & Moccia, general contractor, to Bethlehem Steel Co.

207 tons, student building, University of Idaho, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, School House Lane apartment, Philadelphia, to American Steel Engineering Co., Philadelphia.

135 tons, Washington state highway project, to Bethlehem Pacific Coast Steel Corp., Seattle.

130 tons, Emerson street bridge, for Port of Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

7500 tons, second unit McNary dam, Columbia river; bids to U. S. Engineer, Walla Walla, Wash., July 19.

2600 tons, municipal Ravenswood Houses, Long Island City, N. Y.; Paul Tishman Co., 595 Madison Ave., general contractor.

500 tons or more, Columbia basin projects; J. A. Terteling & Sons, Boise, Idaho, general contractors.

210 tons, slab flooring, state bridge, Annisquam river, Glocester, Mass.; bids June 21, state department of public works, Boston.

205 tons, double leaf bascule bridge, Sea Bright-Rumson, N. J.; bids July 7, state highway department, Trenton.

70 tons, overpass, Greenwood avenue connection, route 26, Trenton, N. J.; bids June 30, state highway department, Trenton.

PLATES . . .

PLATES PLACED

200 tons, steel piling, pier for Naval reserve, Longview, Wash., to Bethlehem Pacific Steel Corp., Seattle; Hart Construction Co., general contract.

PLATES PENDING

14,900 tons steel piping, McNary dam cofferdam and structures, Columbia river, bids to U. S. Engineer, Walla Walla, Wash. July 19.

PIPE . . .

STEEL PIPE PENDING

160 tons, class and type not stated, second unit McNary dam project, Columbia river; bids to U. S. Engineer, Walla Walla, Wash., July 19.

RAILS, CARS . . .

RAILROAD CARS PENDING

Detroit, 60 trolley coaches; bids June 21.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

NORTH HOLLYWOOD, CALIF.—Bendix Aviation Corp., Pacific Division, is constructing a $250,000 plant, No. 2, for manufacture of automotive and tractor hydraulic units; Austin Co., Cleveland, engineer.

SAN LEANDRO, CALIF.—Lucky Stores Inc., W. 132nd Ave., is constructing a $500,000 warehouse, administration building, kitchen and food prepackaging plant and maintenance structure.

CONNECTICUT

GLASTONBURY, CONN.—Consolidated Tobacco Corp., 651 Windsor St., Hartford, Conn., will build a $100,000 warehouse, Oak St.; plans by Mylchreest & Reynolds, 238 Palm St., Hartford.

FLORIDA

GREENVILLE, FLA.—Seminole Electric Cooperative will construct an oil-fueled electric generating plant and connecting transmission lines to supply electric current to seven regular co-operatives which make up the Super Seminole Co-operative, cost $18 million; C. P. McLean, Moultrie, consulting engineer.

MIAMI, FLA.—John Woodrum, c/o M. M. Ungaro, architect, 814 Olympia Bldg., will build a $550,000 warehouse and store.

TAMPA, FLA.—National Linen Co., 445 Highland Ave., N. E., Atlanta, will build a $100,000 laundry; plans by J. B. Jackson, Asheville, N. C.

IDAHO

COEUR D'ALENE, IDAHO—Public Roads Administration is staking right of way for proposed 1297-ft. viaduct type Blue Creek Bay bridge, involving concrete deck and seven steel towers. Bid date not announced.

ILLINOIS

CHICAGO—Frigid Fluid Co., 2431 W. Van Buren St., will build a $250,000 factory; plans by Fox & Fox, 30 N. LaSalle St.

CHICAGO—Packard Motor Car Co., LaSalle & Eugenie Sts., has awarded a $1.5 million contract to Thorgersen & Ericksen, 228 N. LaSalle St.

LOCKPORT, ILL.—Cargill Inc., 135 S. LaSalle St., Chicago, will build a $100,000 grain elevator.

IOWA

COUNCIL BLUFFS, IOWA—Iowa Power & Light Co., 312 Sixth St., Des Moines, Iowa, will build a $5 million power plant.

OSKALOOSA, IOWA—Ideal Mfg. Co. will build a $100,000 factory; plans by William Nielsen, Hubbell Bldg., Des Moines.

KANSAS

KANSAS CITY, KANS.—Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City, N. J., will let a contract soon for a $2 million plant; Albert Kahn Assoc. Architects & Engineers Inc., 345 New Center Bldg., Detroit, architect and engineer.

LAWRENCE, KANS.—Kansas Color Press Co. will build a $750,000 plant.

KENTUCKY

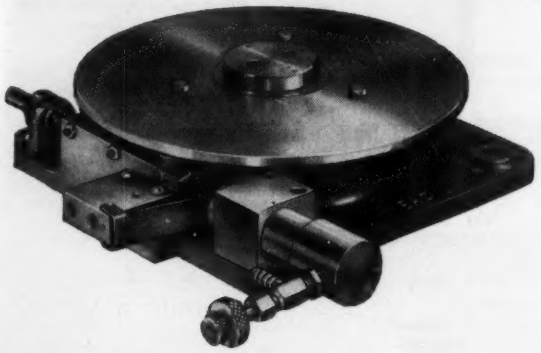
LOUISVILLE — National Distillers Products Corp. will receive bids June 20 for a $113,000 building, 1374 Lexington Rd.

MISSOURI

JEFFERSON CITY, MO.—Lincoln University has awarded a $563,688 contract to George E. Baumann, 713 E. Austin St., Nevada, Mo., for construction of two 4-story dormitories.

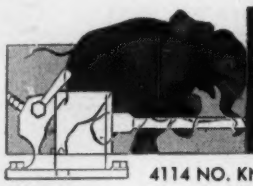
NORTH KANSAS CITY, MO.—Board of Education has been authorized to issue $375,000

Air Operated
ROTARY WORK FEEDER



Deftly holds and delivers small parts to drill, tap, swage, stake, etc. Stations accurate to .002". Guaranteed against over-travel or "skipping". Indexes as slow or fast as you like, up to 10,000 per hour. Compact and sturdy, easy to tool and hook up.

Standard dial plate 10"; available in 12". For a new job, simply tool up a new dial. Readily combines with "MEAD-MATIC" Timer, Air Hammer, Air Press, Drill presses, etc.—to make almost completely automatic machine—operator merely loads. Write for full details.



MEAD
SPECIALTIES COMPANY

4114 NO. KNOX AVE., DEPT SM-69, CHICAGO 41, ILL.

DESIGNERS AND PRODUCERS OF...

Your Special Metal Products

Completely Equipped Plant . . . Low Overhead
Excellent Shipping Facilities

LUCERNE PRODUCTS, INC.
Park Avenue **CHARDON, OHIO** Tel. Chardon 230

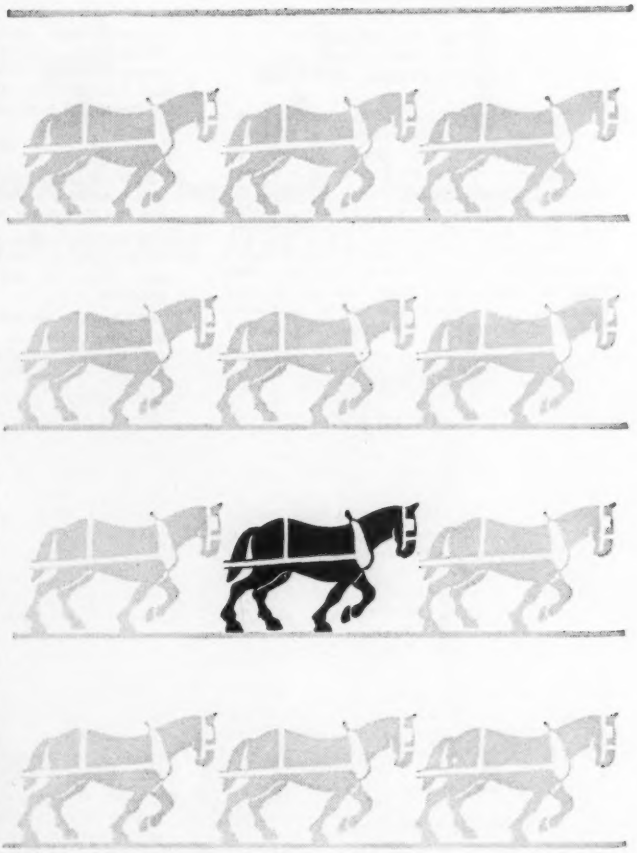
WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

TIN PLATE

COP-R-LOY PIPE-SHEETS

Ductillite
THE MODERN TIN PLATE

WHEELING STEEL



Good work-horses all... but

ONE OUT-WORKS THE OTHERS

Are you looking for a metal cleaner that will do more than just get your production clean? Investigate Parco Cleaners.

Parker's research department, with the knowledge and experience of a third of a century in the science of fine metal finishing, has formulated a line of cleaners whose benefits and advantages carry beyond the rinse-off.

Parco Cleaners remove the grease and soil—and act to condition the metal for the next step in the finishing operation. Now you can select a cleaner that helps you get economy and uniform, high-quality results with your finish.

Try a *harder-working* cleaner on your metal finishing line. Let us help you determine the Parco Cleaner that's right for you.

Get full information!

Write for technical bulletin detailing properties of each Parco Cleaner.

Bonderite, Parco, Parco Lubrite—Reg. U. S. Pat. Off.

Parker **RUST PROOF COMPANY**
2158 E. Milwaukee Ave., Detroit 11, Michigan

BONDERITE corrosion resistant paint base . . . **PARCO COMPOUND** rust resistant . . .
PARCO LUBRITE wear resistant for friction surfaces

in bonds to finance the construction of a field house to seat 2000 persons and include five or six class rooms, 23rd & Gentry Sts.

ST. LOUIS—Foster Bros. Mfg. Co., 2101 S. Vandeventer Ave., has awarded a contract for construction of a plant addition to Jones-Kissner Construction Co., 722 Chestnut St. These improvements designed by Preston J. Bradshaw & Associates, architect, 1800 Olive St., will cost upwards of $200,000.

ST. LOUIS—H. Wenzel Tent & Duck Co., 1035 Paul St., will receive bids June 21 on construction of a 1-story addition to its plant; Frank L. Thompson, Kirkwood, Mo., architect.

NEW YORK

BROOKLYN, N. Y.—Consolidated Edison Co. of New York Inc., 4 Irving Place, New York, will build a $2.5 million generating station; Theron R. Galloway, c/o owner, engineer.

BROOKLYN, N. Y.—Frankmort Realty Corp., 40 Worth St., New York, will build a $100,000 factory and warehouse; plans by Charles M. Spindler, 164 Montague St.

BROOKLYN, N. Y.—Prince St. Holding Corp., 161 Willoughby St., will build a $175,000 factory; plans by Abraham Farber, 66 Court St.; location of factory, 147-53 Prince St.

LONG ISLAND CITY, N. Y.—General Electric Appliance Co., 205 E. 42nd St., New York, has awarded a $1 million contract to Thompson-Starrett Co., 444 Madison Ave., New York, for construction of a warehouse and office, Northern Blvd. near 48th St.

NORTH CAROLINA

FAYETTEVILLE, N. C.—American Bakeries Co. has awarded a $115,425 contract to Southern Builders Inc., for garage and truck area; Stevens & Wilkinson, Atlanta, architect.

WILMINGTON, N. C.—State Ports Authority, Radio Bldg., will receive bids for $7.5 million bonds for construction of 2 modern transit sheds and storage warehouse at Wilmington, estimated at $5 million, and marginal wharf with transit shed and storage warehouse at Morehead City, N. C., for estimated $2.5 million.

OHIO

AKRON—McNeil Machine & Engineering Co. will construct a factory building on its plant site, 96 E. Crosier St.

CLEVELAND—Ohio Overall Cleaning Co., H. A. Humphrey, president, 8002 Central Ave., has plans for an addition to cost about $100,000.

CLEVELAND—Owner, c/o A. G. Breckling, Breckling Coal & Supply Co., 631 Stones Levee, will build a $2.5 million parking garage.

CRESTLINE, O.—Schill Mfg. Co., E. T. Remy, general manager, will build a factory.

DEFIANCE, O.—Toledo Edison Co., Edison Bldg., Toledo, O., will erect a $100,000 service building and garage; plans by Philip T. Sherman; W. H. Schwalbert, Defiance Division, Defiance, O., company engineer.

DOVER, O.—Estimated loss in the explosion and fire at the Hardesty Co. chemical plant in Mooreville, O., was estimated at $240,000.

GENEVA, O.—*Geneva Free Press*, R. B. and Donald C. Rowley, Ashtabula, O., will build a $100,000 newspaper plant.

TOLEDO, O.—Baltimore & Ohio Railroad, H. H. Marsh, engineer, maintenance and ways, central region, Smithfield & Water Sts., Pittsburgh, will construct a $1 million freight terminal for general merchandise near east end of Fassett Street bridge.

TOLEDO, O.—Sun Oil Co., Woodville and city limits, will build a $1 million marine terminal.

YOUNGSTOWN —Youngstown Alloy Casting Corp. will build a $100,000 plant, N. Meridian Rd. between Oakwood & Connecticut Aves., which will include a foundry and an office building.

YOUNGSTOWN—General Fireproofing Co. is building a $175,000 addition to its plant here.

OREGON

PORTLAND, OREG.—U. S. Engineer has awarded a contract to Utah Construction Co., San Francisco, low $837,295, for relocation of 2½ miles of Southern Pacific Railway main line and highway, a unit of Meridian dam project.

PORTLAND, OREG.—Bonneville Power Administration announces the following awards: Bus and switch insulators, Joslyn Pacific Co., $121,948; disconnecting switches, Railway & Industrial Enginering Co., Greensburg, Pa., $56,000; General Electric Co., relays, line traps, capacitators and instrument transformers, $19,932, $11,909, $4,377, respectively; Westinghouse Electric Corp., $28,914, $12,486, $13,795, respectively.

SOUTH CAROLINA

NORTH CHARLESTON, S. C.—West Virginia Pulp & Paper Co. will construct a plant including facilities, chemical recovery unit, $1,140,000; lime kiln, $450,000; turbine and boiler, $1.3 million each; and barking drum $250,000.

SALUDA, S. C.—Palmetto Full Fashion Hosiery Mill will erect a $100,000 plant addition.

TENNESSEE

DYERSBURG, TENN.—City has approved a $1.2 million bond issue to finance natural gas distribution system.

JACKSON, TENN.—Aluminum Foils Inc. has awarded a $1 million contract to Foster-Creighton Construction Co., American National Bank Bldg., Nashville, Tenn., for construction of a production plant; Howard, Hickerson & Jordan, Nashville, architect; order has been placed with Lewis Foundry & Machine Division, Blaw-Knox Co., for mill equipment for rolling aluminum foil.

WISCONSIN

STARKS, WIS.—Starks Farms will build a warehouse; Genisot Engineering Co., 1512 N. Eagle St., Rhinelander, Wis., consulting engineer.

PRICES OF LEADING FERROALLOY PRODUCTS

(*Continued from Page 157*)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W. or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate alowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb or alloy; ton lots 18.00c; les ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.ob. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.ob. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.